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# **Life after stroke – what may affect recovery**

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## **1. THESIS ABSTRACT**

This projects attempts to gain an understanding of the role that perceptions and attitudes to ageing play in the recovery process after stroke. Firstly, a systematic review establishes the current opinion within the literature, and how perceived quality of life and depression interplay during the stroke recovery process.

Whilst a relationship is apparent in the literature, the direction of causality remained unclear, in addition to many contributing factors possibly adding the interaction.

The reader is introduced to the wider context of stroke, looking at the consequences of stroke and the adjustment process. Whilst older adults add a complexity to formulation and clinical work, they are also the predominant age group who experience stroke. Therefore, the role of the ageing process is introduced, in light of the current literature around stroke and recovery.

A journal article then examines the role of attitudes towards ageing and perceptions of quality of life, in older adults after stroke. The relationship between attitudes and perceptions is explored, in relation to depressive symptoms in the sample recruited; using a questionnaire based cross sectional design. The questionnaires used were the Attitudes to Ageing Questionnaire (AAQ), the World Health Organisation Quality of Life, version for Older adults (WHOQOL-Old) assessment and the New Multidimensional Depression Scale (NMDS). A correlational analysis revealed that positive attitudes toward ageing were associated with greater levels of perceived quality of life, and that both were negatively associated with depression. The findings are discussed in the context of ageing literature and incorporating aspects of loss, in an effort to understand how perceptions and attitudes may be protective factors in the journey of recovery from stroke.

## **Declaration**

I declare that I am the sole author of this thesis and that the work contained herein is my own. This thesis or any part of it has not been submitted for any other degree or professional qualifications.

**Lucy M Johnson**

**January 2013**

## **2. ACKNOWLEDGEMENTS**

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## 4. SYSTEMATIC REVIEW

The relationship between depression and quality of life in stroke patients –  
A systematic review.

### 4.1. *Abstract*

**Introduction:** Stroke is a prolific health problem world wide, and a well-known psychological consequence that many stroke survivors experience is post stroke depression. As the focus of rehabilitation has shifted from functional gains to incorporate psychological adjustment, personal perceptions, specifically perceived quality of life, has been the subject of clinical research. This review aims to establish a consensus of current opinion regarding quality of life (QOL) as an interacting factor with post stroke depression (PSD).

**Method:** A selection review criteria enabled relevant papers to be identified from several databases: Embase; Embase classic; OVID Medline; PsychInfo; and from additional manual searches of relevant journal articles. The selected articles were reviewed using a quality criteria, and the journal outcomes synthesised.

**Results:** A total of 15 studies were incorporated in the review, and methodological strengths were identified all papers. All papers reported a relationship or association between PSD and QOL, with additional inconclusive associations reported between demographic and stroke specific variables.

**Discussion:** Findings are discussed in the context of variation in study design and focus of studies. Considerations are given to adjustment after stroke, losses suffered and rehabilitation consequences, in the context of the individual.

**Conclusions:** A consensus was reached that PSD and QOL are related, however that there is complex process, involving many moderating factors occurring following a stroke.

**Key words:** Stroke, quality of life, perceptions, depression, post stroke depression.

## **4.2. Introduction**

Stroke is one of the most prolific health problems within the UK. It is currently the third leading cause of death in the western world (Man van Ginkel *et al.*, 2010) and the single most common cause of disability in the UK (Stroke Association, 2010). Dependent on the type of stroke, onset can be sudden and result in many physical symptoms and health repercussions. Whilst some of the physical symptoms may resolve within a short time, there are often long term consequences, with many stroke survivors being confronted with limitations in physical, psychological and social functioning (Korpershoek *et al.*, 2011). More specifically, changes have been reported in cognitive functioning, physical disability and poor mental health (Tomaka *et al.*, 2006), as well as an increase in levels of social isolation, reliance on others, inability to work and financial instability (Daniels *et al.*, 2009).

In psychological terms, a stroke is often described as a 'negative life event' (Ayerbe *et al.* 2011) and it is well recognised that depression is common following a stroke. Reported prevalence rates of depression however, can vary depending on the study and method of screening. Studies have reported prevalence rates ranging from 25 per cent to 79 per cent (Kneebone & Dunmore, 2000). In a recent literature review of Post Stroke Depression (PSD) by Hackett *et al.* (2005), it was estimated that PSD occurs at some point within their lifetime, in 33 per cent of stroke survivors. This review incorporated prevalence rates of population based, hospital based, and rehabilitation studies and it was found that the pooled estimates of PSD, ranged between 30 per cent to 36 per cent across all settings, and across the acute and rehabilitation phases of treatment. These prevalence rates are considerable and potentially may be an underestimation, due to the variation in study designs. In addition to PSD prevalence, it is helpful to consider the different stages of rehabilitation. The Stroke Association's (2008) definition of the acute phase following a stroke being the first 72 hours, whilst the rehabilitation phase begins once the person is stabilised, and lasts for an undetermined length of time, dependent on the individual.

Whether a person is in hospital or in the community, and regardless of the phase of recovery, current clinical guidelines in Scotland recommend that during treatment, stroke patients should be screened for depression (SIGN, 2010).

In light of this, it is important to gain an understanding of the nature of PSD, however explanations of why it occurs are debated within the literature, as is the role it plays in conjunction with other consequences of stroke. For example, PSD has been shown to be related to the degree of physical disability, functional ability, activity levels (Townend *et al.*, 2006), independence, social support (Ouimet *et al.*, 2001), pain (Simon & Kendrick, 2002) and mortality rates (Wade *et al.*, 1987). Given this potentially broad impact of stroke, it is perhaps unsurprising, that such a major life event can be “psychologically overwhelming for a person’s normal coping skills.” (Whyte & Mulsant, 2002, p. 257).

In most, stroke and its consequences can be overwhelming, whilst the overall experience can be traumatic in nature (Broomfield *et al.*, 2011). In Broomfield *et al.* (2011) the authors describe the current evidence base for the use of CBT for PSD and recommend the use of an augmented and individually tailored CBT approach. This conclusion stems from the rationale of trauma and disruption caused by stroke being specific to the person involved, and it being an individual’s own perception of the event that often governs how they cope and recover. These “perceptions and individual reactions have been recognised as essential when identifying vulnerabilities” in post stroke rehabilitation (Broomfield *et al.*, 2010, p203).

An event such as a stroke, can impact on an individual’s identity. It can also give an individual a new awareness for human temporality and an uncertainty of the future (Hjelmblink & Holmstrom, 2006). These changes, inevitably alter the outlook of an individual and as previously discussed, the perceptions and outlook of an individual plays a key role in adjustment to such an event.

Whilst attempting to gain an understanding of the psychological impact of stroke and the perceptions of those who have had a stroke, ‘Quality of Life’ has been a

recent focus within stroke research. The World Health Organisation Quality of Life (WHOQOL) Group, recently defined the term 'Quality of Life' (QOL) as "an individual's perceptions of their position in life, in the context of cultural and value systems in which they live, in relation to goals, expectations, standards and concerns." In an effort to further understand what factors may play a role in post stroke QOL, recent research has focused on the relationship between QOL and various moderating factors, for example activity levels and physical functioning. Research by Hartman-Maeir *et al.* (2006) looked into the consequences of stroke and reported a strong correlation between activity levels and quality of life ratings, whilst Lin *et al.* (2005) identified the importance of physical functioning in rehabilitation and the subsequent impact this has on post stroke QOL.

Whilst such examples as activity levels and physical functioning have been shown to impact on QOL, the premise of stroke rehabilitation is to promote such functioning, and if possible to regain what may have been lost. Therefore, for many survivors of stroke, recovery is seen as a return to the life they had led prior to stroke, a life encompassing all aspects of that pre stroke existence (Doolittle, 1988; Dowsell *et al.*, 2000). In many cases however, stroke, as an often long-term condition, can leave an individual changed. Changes in physical functional abilities and reduced activity levels often occur, but there may also be cognitive changes, mood/behaviour changes, post stroke anxiety and PTSD. Although rehabilitation can enable progress to be made, goals to be met, and a significant amount of recovery made, many changes are often permanent. Thus, quality of life may remain poor even in the face of what is deemed a good physical recovery (Niemi *et al.*, 1988).

Focusing further on the non-physical outcomes following stroke, the difficulties stroke survivors may have coping with the psychological sequelae of stroke have also been shown to impact on QOL (Alaszewski *et al.*, 2003). In Alaszewski *et al.* (2003) the psychological challenges faced by stroke patients are shown to include difficulties with anxiety, depression and fear of having another stroke.

When examining the context of such difficulties following stroke, it is suggested that these challenges may occur as a result of the loss of protective factors against mental health problems, for example a reduced sense of independence, usefulness, and ability to fulfill certain social roles, e.g. wife, grandmother etc.

Overall, post stroke psychological sequelae, such as PSD, has been shown to impact on QOL however, the presence of perceived poor QOL has also been highlighted in the research as an indicator of those stroke patients at risk from PSD (Broomfield *et al.*, 2010). The conclusions from the research can therefore be puzzling as to what is attributed to what post stroke. The evidence does however indicate that the psychological outcomes following stroke are complex,

When working clinically therefore, identifying an individual's risk factors for poor psychological adjustment is imperative. Within the current healthcare system, rehabilitation programmes following a stroke are tailored to the individual and their subjective experience (SIGN, 2010). This is a positive shift from the focus of rehabilitation centring around functional gains made, as has occurred in the past. By and large, a patient's subjective well-being, or quality of life should be understood to some degree to aid recovery and facilitate adjustment.

To promote this person-centred model and increase our understanding of this client group further, the relationship between quality of life and depression in stroke patients has been investigated. The aim of this current review is to establish the current opinions derived from the evidence base of PSD literature, incorporating QOL as the interacting factor. Whilst the main focus will be on PSD and QOL, there is an acknowledgment that other moderating factors are widely incorporated into psychological research, due to the roles they may also play. Such factors, for example gender, age, activity levels and co-morbidity are considered to varying degree's in the literature. Therefore, considerations in this review will also be given to the roles of these additional variables, in the context of the main focal points of research addressing PSD and QOL in stroke recovery.

### **4.3. Method**

Research papers on this topic were identified by searching databases Embase (1980-2010, Embase classic (1947-1973); OVID Medline (incorporating in process and non-indexed citations)(1946-present) and PsychINFO (1808-2012). Additional manual searches were conducted of related references and articles from relevant journals. The search terms used incorporated 'stroke', 'depression', and 'quality of life', selecting variants of these terms to be incorporated. Research papers combining the three key terms were identified.

#### **4.3.1. Inclusion/Exclusion criteria**

1. Articles published in the English language were selected
2. Primary empirical studies of stroke patients, depression and quality of life.
3. Articles must include all ages (18 and above) and incorporate 'older adults' over 65.
4. Quality of Life measures must consist of more than just a physical functioning measure (incorporating a psychological element).
5. Articles must investigate and report on the relationship between Depression and Quality of Life in stroke patients.
6. Articles must exclude patients who are cognitively impaired, unable to consent and those with communication difficulties.
7. Articles must utilise formal measures of both Depression and Quality of Life domains.

#### **4.3.2. Search screening**

A total of 1709 were found in the initial search, once duplications were removed, the total yielded was 1165 articles. Using the inclusion/exclusion criteria, 1076 articles were then excluded from a review of article titles, and a further 52 were removed on review of article abstracts. Those identified as potentially relevant were retrieved and the full article reviewed, again based on the inclusion/exclusion criteria developed for this review. Following the full articles being reviewed, 22 articles were further excluded. The final review therefore included the remaining 15 studies (See Figure 1.)

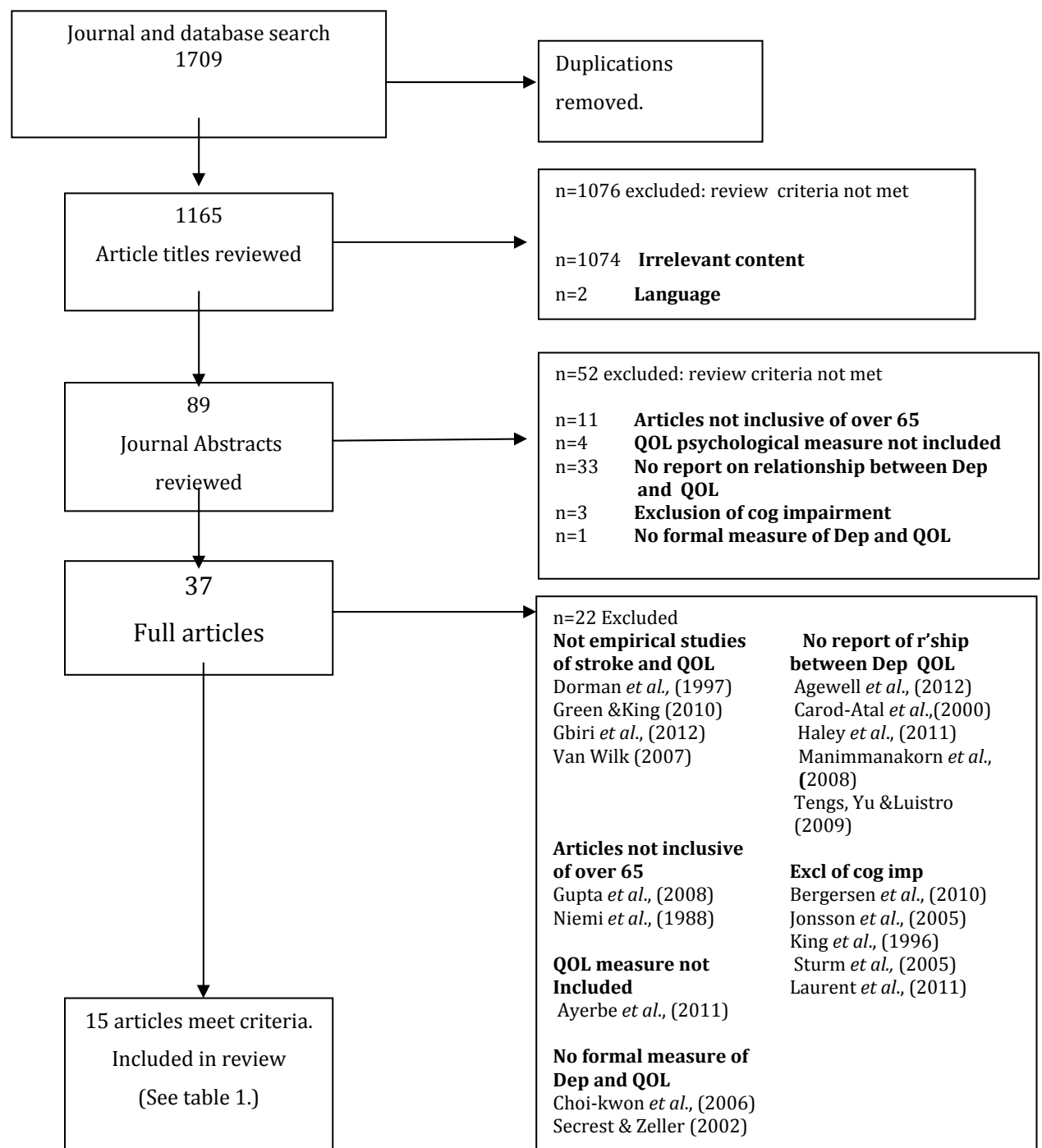


Figure 1. Systematic review of search completed



#### **4.3.3. Assessment of quality of included studies**

Following a review of the topic area literature and existing guidelines from the Centre for Reviews and Dissemination (CRD) published by The University of York ([www.york.ac.uk/inst/crd](http://www.york.ac.uk/inst/crd)), a list of relevant quality criteria was developed. The items included were deemed applicable for this specific review being conducted. The 13 criteria developed were assessed in accordance with outcome ratings: 'Well covered' 2 points, 'Adequately covered' 1 point, 'Poorly addressed' 0 points, 'Not mentioned' 0 points, 'Not reported' 0 points and 'Not applicable' 0 points (see Table 2).

## **4.4. Results**

### **4.4.1. Characteristics of included studies**

In total, 15 studies were identified for the review and comprised of 8 cross sectional studies and 7 longitudinal studies. The settings for these studies also varied; 4 hospital based; 5 based in patient's home; 2 based in hospital and patients homes; 1 rehabilitation centre based; and 3 based at outpatient clinics. (Details of study characteristics are reported in Table 1.)

### **4.4.2. Quality of included studies**

The 15 studies were rated using the quality criteria developed for this review (see Table 2). This rating table offers a summary of the methodological strengths of the reviewed studies. Overall, this review suggests that Almborg *et al.* (2010) conducted the most methodologically sound study, however the majority of the studies were deemed 'good quality' overall (refer to overall quality scores, in Table 2).

The quality criteria covered several aspects of each reviews paper. Firstly, statistical justification was reviewed and across the various studies, only 2 (Almborg *et al.*, 2010; Huang *et al.*, 2010) adequately justified their sample size via power calculations.. In the remainder, it was unclear as to whether the studies had been sufficiently powered. Following this, and due to the nature of the variables being investigated, it was deemed a methodological strength for papers to state explicitly definitions for the terms being measured, 'Depression' or 'Post Stroke Depression' and 'Quality of Life.' These however, were not made clear across all studies. In a similar vein, a methodology describing the varying measures and questionnaires used to measure these variables was considered to be a strength. This incorporated explicit detail of the validity, reliability, and applicability of each measure, for use with such a population group. Several studies met this criteria successfully (Almborg *et al.*, 2010; Gbiri *et al.*, 2010; Giaquinto *et al.*, 2010; Huang *et al.*, 2010; Jaracz *et al.*, 2003; Moon *et al.*, 2004; Raju *et al.*, 2010; Teoh *et al.*, 2009; Unalan *et al.*, 2008.)

**Table 1. Description of studies reviewed**

	Study	Mean age/ range(R)	% Female	Design	Setting	Time since stroke	QOL Measure	Dep Measure	Relevant additional measures	Key Findings
1.	Almborg <i>et al.</i> (2010) <b>Sweden</b>  n = 188	74 ±11.2  R=32-92	44	Cross- sectional	Own home	2/3 weeks	SF-36	CES-D	BI; FAI; P-QPD	19% Patients had Depression (CES-D cut off of >16/60= Depression)  SF-36 (8 subscales – 4 Mental Component 4 Physical component)  Lower scores on all subscales of SF-36, associated with depression scores (negatively affected by Depression).
2.	Altindag (2008) <b>Turkey</b>  n = 40	66.7± 2.7	N/R	Cross- sectional	Hospital	13.5 mnths ±3.2	SF-36	BDI	SA-SIP	BDI scores shows that 12.2% of patients have mild, 36.6% patients have moderate, and 48.7% patients have severe depression.  BDI Correlates with SF-36 Physical functioning 3.p=0.002 r=- 0.474 Physical problems p=05..008 r=-0.417 Emotional Problems p=0.01 r=-0.369 Mental Health p=0.03 r=-.0369
3.	Donnellan (2010) <b>Ireland</b>  n = 107	R= 20-98  65% >65 yrs.	48.9	Longitudina l	Own home/ hospital	1 mnth/1 yr	SS-QOL	HADS	NEADL	Depression symptoms were significantly associated with poorer HRQoL at T1 (r =0.56, p < 0.001) and at T2 (r =0.41, p < 0.001)

4.	Gbiri (2010) <b>Nigeria</b> n = 65	58.1± 15.7	50.7	Longitudinal	Hospital/ own home.	72hrs/6 mnths	SS-QOL	CES-D	NIHSS	Depression constant determinant of QOL Depression, stroke severity and co morbidity most significant predictors of QOL
5.	Giaquinto (2010) <b>Italy</b> n = 111	N/R	51.3	Outcome study.	Rehabilitation Center	2/3 mnths	WHO-QOL	HADS	FIM; CIRS	HADS and QOL on admission $r = -0.569$ ( $p < 0.0001$ )
6.	Huang (2010) <b>Taiwan</b> n = 102	64.9± 11.8 R= 32-90	43.1	Cross sectional study	Outpatient Hospital	N/R	QLI-stroke	CES-D	SSI BI	Negative correlation between QOL and Depression $r = -0.73$ ; $p < 0.01$ .  Mediatory of social support also analysed.
7.	Jaracz <i>et al.</i> (2003) <b>Poland</b> n = 72	65.1 R= 33-85	63.8	Longitudinal study	Own home.	6 mnths	QLI-stroke	ZDS	SSS; BI	Negative correlation between QLI (QOL) and Depression scores $r = -0.46$ ; $p < 0.01$
8.	Kamel <i>et al.</i> (2010) <b>Egypt</b> n = 50	55±8.2 R= 35-71 yrs	38	Longitudinal design	Hospital	1mnth/ 3 mnths	SIS	BDI	NIHSS	>16 BDI score vs mean SIS score = $50.1 \pm 12.6$  <16 BDI score vs mean SIS score = $68.5 \pm 12.6$  Significantly lower scores in depressed patients ( $p = 0.001$ )
9.	Kim <i>et al.</i> (1999) <b>Canada</b> n = 50	75 ± 6.07 R= 63-86	N/R	Cross sectional design	Own home.	12-36 mnths	QLI-stroke	CES-D	FIM; BI	QOL and Depression score $r = -0.50$ ; $p < 0.001$ . Multiple regression showed the Depression accounted for 32% of QOL variance.

10.	Kong <i>et al.</i> (2006) <b>Singapore</b> n =100	60.7± 0.8	37	Cross sectional design	Outpatient clinic	1yr +	SF-36	BDI	(mBI)	Depression significantly associated with PCS and MCS of SF-36.
11	Moon (2004) <b>S.Korea</b> n = 69	1. 64.1± 9.6 2. 63.5± 11.0	37.6	Longitudinal study	Stroke unit	<2 mnths	WHO-QOL (Bref) Only collected at follow up	BDI	BAI; BI;	Low QOL group/2.Control QOL group The risk of low QOL was about six times greater in the depressed group than in the non- depressed group in the acute phase of stroke (aOR = 6.26, 95% CI = 2.14 – 18.29)
12	Rinu (2010) <b>India</b> n = 162	54.3 ± 12.9 R = 21-88	30.2	Cross sectional study	Stroke and Neurology clinics	≥1 mnth	WHO-QOL (Bref)	HADS	BI; FIM; mBI	Correlations between WHOQOL domains and HADS Depression score: Physical r=-0.33; p<0.001 Psychological r=-0.46; p<0.001 Social r=-0.45; p<0.001 Environmental r=-0.46; p<0.001
13	Teoh (2009) <b>Australia</b> n = 135	R= 25-96	31.8	Longitudinal study	Own home	6-24 mnths	AQoL; SIS; SLWS)	CES-D	SES; RLOC; mRS	Fewer depressive symptoms consistently associated with better AQoL, SWLS, and SIS scores at baseline, 10 weeks & 6 months p<001
14	Unalan (2008) <b>Turkey</b> n =70	60.16±11.3 R= 23-80	61.4	Cross sectional study	Neurology Outpatient Clinics	6 mnths	SF-36	BDI	CNS; FIM	Negative relation between QOL and Dep. As Social func/MH/Vitality/General Health inc, BDI scores >18 likelihood decreased.
15	Weerd <i>et al.</i> (2011) <b>Nether-lands</b> n =57	77 R= 65-81	56	Cross sectional study.	Own Home	1yr	SF-36	HADS	BI	Non depressed significantly higher HRQOL Comparisons made with general Dutch population.

**Table2. Methodological critique of papers**

	i) Diagnosis	ii) Time since	iii) Missing data	iv) Depression	v) QOL	vi) QOL measure	vii) QOL valid	viii) Dep measure	ix) Dep valid	x) Analysis	xi) Sample	xii) Power	xiii) Other measures	Total =26
1.	2	2	2	2	2	2	2	2	1	2	2	1	2	24
2.	2	2	0	2	1	2	1	2	1	2	0	0	2	17
3.	2	2	2	1	0	2	0	2	0	2	1	0	2	16
4.	1	2	1	0	2	2	2	2	2	2	1	0	2	19
5.	2	2	1	0	2	2	2	2	2	2	1	0	2	20
6.	2	0	0	2	2	2	2	2	2	2	1	2	2	21
7.	2	2	2	2	2	2	2	2	2	2	1	0	1	22
8.	2	2	0	2	2	2	2	2	1	2	0	0	2	19
9.	1	2	0	2	2	2	2	2	2	2	1	0	2	20
10.	2	2	0	2	1	2	2	2	0	2	0	0	2	17
11.	2	2	0	2	0	2	2	2	2	2	0	0	2	18
12.	2	2	2	2	2	2	2	2	2	2	0	0	2	22
13.	2	2	2	2	0	2	2	2	2	2	2	0	2	22
14.	2	2	0	2	0	2	2	2	2	2	0	0	2	18
15.	1	2	2	2	0	2	2	2	0	2	0	0	2	17

i) Diagnosis of stroke detailed and confirmed

ii) Time since stroke considered/ first or recurrent stroke considered

iii) Details of missing data and participants who did not complete

iv) Depression diagnosis (symptoms or diagnosis) detailed and considered

v) Quality of Life defined

vi) Quality of Life outcome measure appropriate measure for stroke patients in the context of study setting

vii) Quality of Life outcome evidenced to be valid, reliable and appropriate, with psychometric values specified by the authors.

viii) Depression measure appropriate measure for stroke patients in the context of study setting

ix) Depression outcome measure evidenced to be valid, reliable and appropriate, with psychometric values specified by the authors.

x) The statistical analysis is appropriate for the study design and outcome measures.

xi) Sample selected with consideration of selection bias.

xii) Power calculation reported

xiii) Other variables and measures incorporated into analysis and interactions reported

With regards to the outcome measures, several different scales and questionnaires were used in the reviewed papers, to measure PSD, QOL and other related variables. Those that are disease (stroke) specific, for example Quality of Life Index- Stroke version (QLI) (Ferrans & Powers, 1985), have the advantage of being tailored to the particular group of patients. They can also elicit relevant information and may be more likely to detect important changes in this client group. However, they limit comparisons with other health groups and may not fully consider co-morbidity factors. The other more general measures used, for example WHOQOL-Bref (1998), allow for comparisons to be made across different presentations, and most measures used had been reported as being reliable and valid within this client group.

All studies included in this review investigated the relationship between Post Stroke Depression (PSD) and Quality of Life (QOL), whilst also looking at or controlling for additional variables. Among those variables were participant's functional ability, co-morbidity, level of social support, stroke and lesion location and other factors, such as post stroke anxiety and pain. When reviewing the literature, due to the variation of variables incorporated by different researchers, it was deemed important for studies to detail at least basic descriptive information when reporting results. The demographic information of the sample, details of the time since stroke and the location of the study/participants are examples of key factors that should be factored into studies. The inclusion of this information allows for a fuller understanding of the participants' context and for comparisons and hypotheses to be made across the evidence base. All studies, bar one, reported such information, however a degree of variation was observed with regards to the depth of consideration given to these factors during analysis.

Finally, all the studies reviewed utilised either a correlational or a longitudinal design. While this allows various hypotheses to be generated, one cannot infer causal relationships in several of the studies.

#### 4.4.3. Synthesis of outcomes

Across all of the studies included in this review, a relationship between PSD and QOL was reported by the authors (see Table 1 for summary of key findings.) Depression was reported to be negatively correlated with QOL ( $r = -0.569$   $p < 0.00$ , Giaquinto *et al.*, 2010;  $r = -0.73$   $p < 0.01$ , Huang *et al.*, 2010;  $r = -0.46$   $p < 0.001$ , Jaracz *et al.*, 2003;  $r = -0.50$   $p < 0.001$ , Kim *et al.*, 1999). More specifically, Rinu *et al.* (2010) reported correlations between WHO-QOL domains and the Hospital Anxiety and Depression Scale (HADS) depression scores (Physical  $r = -0.33$ ,  $p < 0.001$ ; Psychological  $r = -0.46$ ,  $p < 0.001$ ; Social  $r = -0.45$ ,  $p < 0.001$ ; Environmental  $r = -0.46$ ,  $p < 0.001$ .) Fewer or no depression symptoms, were found to be associated with better QOL (Teoh *et al.*, 2009; de Weerd *et al.*, 2011). Whilst poorer QOL was found in those with moderate-severe depression (Kamel *et al.*, 2010), and in those who were depressed when compared to non-depressed (Moon *et al.*, 2004). The research also concluded that depression is a predictor of QOL in stroke patients (Jaracz *et al.*, 2003) and that PSD and QOL are linked (Donnellan *et al.*, 2010; Altindag *et al.*, 2008; Gbiri *et al.*, 2010; Kong & Yang, 2006; Unalan *et al.*, 2008). Finally, in this review's most robust study, all aspects of QOL measures were found to be negatively impacted on by depressive symptoms (Almborg *et al.*, 2010).

#### 4.4.4. Additional variables considered

On reviewing the literature, it was apparent that PSD and QOL are complex issues that have multiple interacting determinants (Jonsson *et al.*, 2005). Within the studies reviewed, many different factors were measured and controlled for, in addition to PSD and QOL.

##### 4.4.4.1. Gender

In the Almborg *et al.*, (2010) study, a gender effect was reported, with women reporting more depressive symptoms and lower health related quality of life than males in a representative sample. Donnellan *et al.* (2010), Kong *et al.*, (2006) and Jaracz *et al.* (2003) however, reported that gender was not related to depression or health related quality of life. This variance is perhaps surprising as there is evidence to suggest females are more at risk of suffering from



depression (Kessler, 2003). On the other hand, when considering stroke as well as the wider population, consideration must be given to rates of under reporting and societal attributes of depression.

#### 4.4.4.2. Functional ability

Functional ability was reported to be an additional predictor of QOL (Jaracz *et al.*, 2003; Kamel *et al.*, 2010), with QOL being positively correlated with functional status during acute and rehabilitation stages after stroke (Giaquinto *et al.*, 2010). In the context of depression, functional ability was found to be negatively correlated with depressive symptoms (Giaquinto *et al.*, 2010; Donnellan *et al.*, 2010). Overall, increased functional ability can be attributed as being a protective factor against mental illness, in line with behavioural theories of depression.

#### 4.4.4.3. Co morbidity

A further variable considered in some studies was co-morbidity in stroke patients, as such long term conditions typically occur in the presence of other physical health problems. The findings however, have been inconclusive with co-morbidity reportedly impacting on QOL 6 months post stroke (Gbiri *et al.*, 2010), then being shown to have no relationship in another study, at the same stage post stroke (Jaracz *et al.*, 2003). This variation may be attributed to a difference in the nature and severity of co-morbidity in patients, as well as individual perceptions and health beliefs held by individuals. Intuitively, an increase in physical health complaints should have negative implications for a person, however research has shown the degree of resilience and coping that can occur in the face of such events can be considerable (Tugade, 2004).

#### 4.4.4.4. Social support

In addition to co-morbidity, the role of social support has been a factor considered as playing a role in the psychological and physical adjustments an individual is required to make following a stroke. Kim *et al.* (1999) reported social support to be a predictor of QOL, whilst Jaracz *et al.* (2003) and Teoh *et al.* (2009) concluded that emotional support was related to QOL. Furthermore,

Huang *et al.* (2010) reported that social support can play a positive role, often mediating the relationship between PSD and QOL. Similarly to functional ability, research findings of the role that higher levels of social support play in stroke rehabilitation conclude that there is an association between higher levels and better post stroke outcomes. However, the studies reviewed, along with other research within this area, do not sufficiently consider the definition of the social support being investigated or measured. The nature, quantity and quality of support being provided is often not considered and therefore these studies do not sufficiently inform our practical understanding of what can improve rehabilitation.

#### 4.4.4.5. Stroke specific factors

The impact of more stroke specific factors, such as severity, lesion location and number of stroke suffered, is debated within the literature, with findings remaining inconclusive as to the role of such factors. Within this review, studies reached conflicting conclusions. Stroke severity was found to impact QOL (Gbiri *et al.*, 2010; Donnellan *et al.*, 2010), whilst having a previous history of stroke was found to be related to health related QOL. On the other hand, no relationship was found between stroke severity/ lesion location and QOL or depression (Jaracz *et al.*, 2003; Kong *et al.*, 2006). These studies, whilst they examined the role of such stroke specific factors within the context of QOL and PSD, they fell short at considering how these factors interact with other relevant moderating factors, such as those discussed above.

#### 4.4.4.6. Age

The final aspect to be considered is age, which is also relevant to the individual context of those participants included in the studies. Age brings its own complexities, such as age related reduction in physical functioning and increased physical health problems. This, along with higher rates of depression in older people lends to the assumption that increasing age may cause negative outcomes in stroke patients. This however, was not consistently found in the studies reviewed. Unalan *et al.* (2008) found a positive correlation between BDI scores and age, however Kong *et al.*, (2006) found no association between age and

depressive symptoms. In relation to quality of life, age was found to be a determinant of QOL in the first 6 months (Gbiri *et al.*, 2010), and to be negatively associated with QOL (Huang *et al.*, 2010). Nevertheless, the two have also been shown to be unrelated (Donnellan *et al.*, 2010; Jaracz *et al.*, 2003; Rinu *et al.*, 2010). Again, the exact role that age plays is unclear, although it is worth consideration and has been shown to have a predictive value of the outcome in some stroke patients (Giaquinto *et al.*, 2010).

## **4.5. Discussion**

This systematic review identified an interaction within the literature between the presence of PSD and perceived quality of life in stroke survivors. Despite this consensus being reached, the exact nature of the relationship and any direction of causality remains unclear. The uncertainty of this conclusion stems from the main focus of studies showing a degree of variation. Although all papers reviewed investigated the nature of the relationship between PSD and QOL, some have PSD as the main focus, whilst others have QOL. This variation reflects the conclusions derived, in that a relationship has been shown to exist, but the direction of it remains unclear.

### **4.5.1. Differing study designs**

The variation in study designs included in the review allowed for conclusions to be drawn based on cross sectional and longitudinal designs. Despite the variation, the results showed that difficulties such as PSD and reduced QOL appear to be the result of a complex interaction of factors. Such interactions incorporate personal traits, social circumstances, living arrangements, functional abilities, psychological reactions and organic backgrounds (Unalan, 2008).

### **4.5.2. Individual characteristics**

The impact of individual characteristics and subsequent variations in adjustment following a stroke is unclear, however these variations must be considered as personal characteristics have been found to predict psychological reactions to an event, such as a stroke (Viney & Westbrook, 1981). The studies reviewed here all considered individual characteristics to some degree.

Co-morbidity, physical functioning, gender, age, lesion location, and social support are some of the variables considered in conjunction with PSD and QOL, nonetheless further exploration of the dynamics, within an individual post stroke, requires further exploration as it can incorporate much more.

#### **4.5.3. Adjustment considerations**

The presence of additional co-morbid conditions, as well as the possibility of an individual having suffered from more than one stroke, may play a role in an individual's adjustment. Intuitively, the presence of several health conditions may have a cumulative burden on a patient. However, when exploring the deeper psychological constructs, an individual living with a long-term condition may mean they have developed resilience for coping with poor health. For example, when living with a long-term condition, people may have developed emotional coping mechanisms, such as pacing, having a health focused network of support and being familiar with health care systems. Psychologically therefore, the presence and experience that comes from additional health problems may in fact be a protective factor in recovery from stroke.

Interestingly, within the stroke literature variations in coping and adjustment styles have been found when comparing first time stroke sufferers to recurrent stroke sufferers (Teoh *et al.*, 2009). Recurrent stroke sufferers have shown an increased ability to cope and adjust to the changes, which can occur after a stroke. In addition to this, physical health co-morbidity and any pre existing difficulties with depression, may also lead to differences in psychological adjustment and coping styles across different individuals.

The process of adjustment and coping following a stroke has implications for an individual's self-identity, causing changes to social roles and reduced independence (Robinson, 2003). Stroke survivors may experience a reduced sense of control and a shift in life perspective may occur, as stroke is recognised for taking away an anticipated future (Laidlaw, 2008). The onset of such an acute physical health problem requires an individual to adapt rapidly in a highly emotive and changeable situation. The dynamics of such a situation are complex and an individual's crisis management skills can be unprepared. As discussed earlier however, should the person have experience living with a long term condition, such as another vascular event, crisis management skills may be already well versed.

#### **4.5.4. Rehabilitation considerations**

A reduction in perceived quality of life following a stroke is to be expected, however people can adapt and rehabilitate. Personal growth can occur with an individual's well being after a stroke incorporating a sense of this personal growth, environmental mastery and positive emotion with others (Clarke, 2003). Furthermore, an increase in sense of mastery and perceived control has been shown to improve perceived quality of life in stroke survivors (Teoh *et al.*, 2009), and is an important focus of rehabilitation and long-term adjustment.

Perceptions, individual experiences and systemic context are often reoccurring themes as the literature on stroke survival and rehabilitation develops. The time at which stroke survivors take part in such research, in relation to time since a stroke occurred however, appears to be restricted and should be considered. Much of the literature and most rehabilitation studies focus around the first 2 years following a stroke, as this is felt to be a pivotal time for physical and psychological adjustment. The papers incorporated in this review focused on a range of time periods, from only hours after admission for acute care, up to 2 years post stroke. This is often defined as the period of rehabilitation, in which an individual must negotiate the process of overcoming and learning to cope with any damage the stroke may have caused (Stroke Association, 2008). This however, is a functional focus and definition of rehabilitation, with the long-term living and psychological adjustment of stroke survivors often being overlooked.

In addition to the stage at which the stroke survivor is at, the systems which exist around them need to be considered, particularly during rehabilitation. More specifically, the family and support network of an individual has been shown in this review, to play a key role in the outcome following stroke. The components of particular family and support systems can vary, and research is limited regarding the optimal nature of external support being provided. To illustrate the complexities of the role that social support aspects following a stroke, Glass and Maddox (1992) described 3 different types of social support; emotional, instrumental and informational. They investigated the impact of each, and

concluded that differing degrees of all three are required, dependent on the stage of the person, post stroke.

#### **4.5.5. Conceptualisation of adjustment**

There is inevitably a degree of individual difference and variation in adjustment and coping styles in stroke survivors. Regardless of the individual however, the impact of a stroke will require a period of psychological adjustment. To gain a better understanding of this adjustment, conceptualisation of the process within the context of a grief resolution approach can provide useful insights. Ultimately, a person is grieving for their former self and experiencing emotions typically associated with bereavement, for example denial, hopelessness etc. These losses that a person can experience following a stroke can be extremely distressing to work through and resolve (Broomfield, 2010.) It could be argued therefore that depression, seen within a grief context of adjustment, could be a necessary and healthy response in the early stages of post stroke adjustment, and as such, psychological interventions should be tailored accordingly.

Taken as a whole, this is a complex issue, and although the acute, rehabilitation, and long-term phases of stroke pose many challenges for those survivors, an accurate assessment of an individual's needs is essential for future well-being and health care provision. It has been established that an understanding of the presence/risk of depression and perceived poor quality of life is imperative when developing a person-centred health care approach.

#### **4.5.6. Strengths of review**

Following from the conclusions derived from this review, personal characteristics and consequences following stroke are relevant to both physical and psychological adjustment. The focus of this review was on the relationship between PSD and QOL, however attention was also given to additional interacting factors. These factors were explored in addition to the two main factors, to give a fuller understanding of the possible psychological outcomes of stroke.

#### **4.5.7. Limitations of review**

This review used an explicit criterion when selecting papers to be included, in an effort to minimize heterogeneity. However, this method of review may have excluded potentially relevant studies with different designs or methodologies. Conversely, the criteria did not exclude papers with varying outcome measures. Although this trend of outcome measure variation is apparent within the literature, it limits comparability of statistical findings. Furthermore, this review was also restricted to English language papers, and not all electronic databases were incorporated into the search.

The topic reviewed features a wide subject area, therefore by attempting to increase the specificity of those studies included, the synthesis was then only based on a small number of studies. What's more, by trying to explicitly compare such relationships, it is acknowledged that additional factors could not be considered in sufficient depth.

Studies that incorporated patients with language or communication difficulties and cognitive impairment were also excluded from this review. These were included as part of the review criteria due to the trend within the literature of excluding such patients from studies. This is however, a major criticism of this review and the wider evidence base. Due to the prevalence of communication difficulties in stroke survivors, occurring in approximately 33% of people (Stroke Association, 2012), the representativeness of those included in many research studies is questionable.

#### **4.5.8. Further limitations in the evidence base**

The use of different outcome measures is an additional limitation of the evidence base. As shown in this review, studies have the tendency to use a wide variation of outcome measures for both depression and quality of life, along with all other factors considered. Although outcomes can be discussed, varying measures impedes researchers being able to draw conclusions and make statistical comparisons. More specifically, certain measures are thought to be unsuitable for use with different populations. Depression scales, for example the BDI, which



focus on physical symptoms of depression, can be misleading. Due to the overlap with physical symptoms caused by additional factors, such as stroke, age, being bed bound and other health conditions, the scales may not identify depressive symptoms exclusively.

The time frame within which stroke patients were investigated also varies a great deal between studies. Within health care and stroke research, the period of rehabilitation is understood to incorporate the first 2-5 years following a stroke, with focus typically being on the first 2 years. Stroke has been defined as a 'Long Term Condition' (British Medical Association, 2008), and has lifelong implications for an individual and their families. It is therefore apparent that longer-term research into the psychological consequences of stroke should be more widely undertaken. As discussed earlier, pathologising depression in the early stages of stroke and focusing research at this stage may in fact be unhelpful. The initial reactions to such an event can be conceptualised as a person engaging in a grief like process.

Depression as a diagnosis, or as a combination of symptoms presented by an individual, is measured and described in many ways within the literature. As previously discussed, many self-report depression measures are used, and have been shown to be valid and reliable for use within this population. Self-report measures are inherently limiting, and consistency is again an area of limitation. To try and accommodate for this, research has used clinical opinion derived from interview, as well as clinical diagnosis based on diagnostic criteria (DSM-IV/ICD-10) to determine the presence and degree of depression severity. This lack of consistency is ongoing and impacts the applicability of research.

#### **4.5.9. Implications for future research and clinical practice**

Currently, it is clear that both depression and reduced quality of life are common following a stroke. The causal direction and nature of the interaction are unclear and both need to be considered. Clinical guidelines for providing health care and support for someone who has had a stroke therefore encourage both assessment of physical functioning and psychological well being (NICE, 2010.)

In terms of measurement and assessment of psychological well being after a stroke, there is some discrepancy in what is deemed the most effective and efficient method. This is highlighted by the degree of variation within the literature as discussed earlier, with some researchers and clinicians using a stroke specific measure, and others preferring more generic outcome measures. Indeed some measures are favoured above others, but perhaps addressing the need for a 'gold standard' measure is a future direction and role for clinical research within stroke.

The assessment of depression specifically, as well as overall psychological well-being, is paramount in health care. The rationale for which stems from the potential long term consequences that mental health problems can have for an individual and the management of any risk. The presence of depression has been associated with many factors contributing to ill health, for example increased disability, suicidality and mortality (Lenze *et al.*, 2001; Schulz *et al.*, 2000). It can also impede rehabilitation potential by causing low motivation etc.

In stroke survivors, depression is an extremely common difficulty (Hackett, 2005). However, depressive symptoms and major depression are not always adequately differentiated within the literature. In terms of clinical assessment, depressive symptoms following a stroke are used to identify those at risk, however these symptoms do not necessarily mean that major depressive disorder will occur. When trying to identify those at risk, and the likelihood of depression occurring, a biopsychosocial approach to understanding the individual is the approach of choice. This incorporates a psychological element, gaining an insight into the perceptions and beliefs of an individual, in the context of their physical and social environment. These many interacting variables, including perceptions and beliefs, should be used to identify those at risk of developing depression and in the design of future interventions (Ayerbe, 2011).

#### **4.6. Conclusions**

The current review critically evaluated the strength of the evidence base pertaining to the relationship between post stroke depression and quality of life. Areas of research have looked at the relationship between these factors and established the two are related to each other. However, most research incorporates these factors in addition to other aspects, relevant to an individual who has suffered a stroke. From this review, it is clear that there is a complex process occurring, which is moderated by several variables and which varies across individuals. Whilst PSD and QOL are concepts that are inherently linked with other factors, when working clinically with this population, identifying potential risk factors for emotional distress such as QOL is imperative (Thomas & Lincoln, 2008). Addressing such distress and supporting people with their emotional journey through stroke is essential, whilst attempting to identify and offer early intervention and preventative support.

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## 5. INTRODUCTION

Following on from the systematic review presented in Chapter 4, this introduction bridge briefly highlights the specific nature of the chronic physical illness of stroke and provides a wider context of the theoretical and clinical focal points of this project.

### **5.1.      *Stroke***

The World Health Organisation (2010), describe stroke occurring ‘when there is a disruption in the blood supply to the brain.’ More specifically, there are two main types of stroke that can occur. Ischaemic stroke happens as a result of a blood vessel in the brain becoming blocked by a blood clot, air bubbles or fat globule. Haemorrhagic stroke occurs when a blood vessel in the brain ruptures.

It can have varying consequences and has the potential to impact of all aspects of an individual’s identity; including personal, social, psychological, and environmental areas of life.

#### **5.1.1. Stroke demographics**

Stroke can occur at any stage of life, with recent figures reporting that during 2010, approximately 110,000 strokes were recorded throughout the UK (The National Audit Office, 2010). Approximately 75 per cent of these occurred in adults aged over 65, a figure which provides an important contextual consideration when gaining an understanding of the population of stroke survivors.

Although there are efforts being undertaken to prevent this number increasing (see section 5.1.3), of those strokes that do occur, due to health care and medical advances, more people are surviving stroke (Evans, 1998). As more people survive the acute phase of the illness, there has been a wealth of research examining the process of recovery and rehabilitation in the longer term, including the clinical and health care initiatives and wider societal factors

involved in maximising an individual's quality of life as they live with the consequences of stroke.

### **5.1.2. Population change**

There is currently a significant shift occurring in the demographic nature of the population. People are living longer and this increase longevity is leading to the older age groups making up an increasing proportion of the population (WHO, 2001). This positive change however brings with it many challenges for society and in particular, for health care.

### **5.1.3. Implications on health care and policy**

Older people, aged over 65, are more prone to chronic illness, with 50 per cent of this age group experiencing at least one physical illness. In the context of the stroke demographic, recent government figures suggest that stroke is the third most common cause of mortality in Scotland (Scottish Government, 2012).

With this in mind, how do health care and policy initiatives respond to ensure quality of care and quality of life for these individuals?

The National stroke strategy (2007) and Scotland's Better Heart Disease and Stroke Care Action Plan (2007, revised in 2009), were published to reflect the focus within the National Health Service on the importance of stroke prevention, treatment and management. Within the current NICE guidelines, a shift in perception is described, from stroke being seen as a consequence of age and an inevitably resulting in death or disability, to a preventable and manageable illness (NICE, 2008). This is an important change, identifying an improvement of professional and public knowledge, however as previously mentioned, stroke does occur more so in the older population than in any other. Whilst it shouldn't be seen as an inevitable consequence of age, due the role that age plays, in terms of the impact of stroke, rehabilitation considerations and the adjustment to the changes brought about by stroke must be considered (SIGN, 2010).

## **5.2. Stroke recovery**

### **5.2.1. Stroke treatment**

The primary focus of stroke care is identifying symptoms and diagnosis. To promote public awareness of stroke as a medical emergency, a relatively recent initiative from Stroke Association and the NHS, the FAST campaign has been promoted within the UK. The aim of which is to educate and encourage, enabling earlier, more effective medical interventions at the early stages of stroke. (SIGN, 2008).

During the acute phase of stroke, medical and health care focus is on the process of assessing and managing the needs of a person, in terms of their physical health and functioning (SIGN, 2008). As a stroke survivor begins the rehabilitation phase, efforts continue to focus on physical health and incorporate additional aspects e.g. self-care, social functioning and interpersonal factors.

### **5.2.2. Consequences of stroke**

The consequences of stroke can be far reaching and vary dramatically across different individuals. Research has shown stroke to cause changes in physical functioning, mobility and cognitive functioning (Berg, 2001; Tomaka *et al.*, 2006); it can impinge on social functioning, cause increased isolation and dependency on others (Boden-Albada, 2005); it can bring about changes in family and social roles (Haslam, 2008); and impact on a person's mental health (Hackett *et al.*, 2005).

This extensive list of social, environmental and psychological factors are of equal importance when considering the impact of stroke, and they do not occur independently of one another and their effects are cumulative. Whilst the impact of stroke on a person's overall well being varies from person to person (Clarke, 2009), it is apparent that dynamic process exists.

### **5.2.3. Psychological factors**

During recovery, some overcome and adapt to changes and limitations, whilst other can be devastated by the sequelae of stroke (Clarke & Black, 2003). As highlighted in Chapter 4, many survivors experience post stroke depression (PSD) in the months and years following stroke. Whilst an explanation of why so many suffer from PSD is still unclear, prevalence rates, and the role PSD plays in complicating recovery and increased mortality rates (Mitchell, 2008) provides rationale for clinical research.

### **5.2.4. Role of ageing**

When discussing the impact that stroke has on the individual, in terms of psychological, physical, social and environmental factors, the role that ageing plays should be considered. As the stroke population is increasing, both the context of the demographics of stroke survivors, as well as the implications that chronic illness have on lifestyle and often on an individual's view of their self and the world provide the impetus for further deliberation.

#### **5.2.4.1. Theories of ageing**

The process of ageing has been explained by many theories, which aim to capture and explain the development and changes faced by various challenges through the life course.

In Erikson's theory of psychosocial development (1963, 1998), it is suggested that humans endure a series of major crisis throughout life. These crises occur and cause a confrontation between an individual's identity and the demands being posed by social and/or personal situations. This model views old age in a life course perspective and suggests that successful ageing incorporates resolutions and mastery of certain tasks at different stages of development (Brown & Lowis, 2003). Building on this theory, the Socio-emotional Selectivity Theory (Carstensen, 1993) describes ageing in relation to a change in emotional and motivational focus as we age. She postulates that there is a shift in focus from orientated/knowledge related goals during early years, to focusing on person orientated/emotional related goals in later stages of life. This was shown



to hold true for younger adults with a foreshortened future (HIV population) and is therefore attributed to Future Time Perspective rather than age *per se* (Carstensen & Fredrickson, 1998).

Although there are many other theories of ageing, both the theory of psychosocial development and the Socio-emotional Selectivity theory view life in relation to stages, suggesting a particular age does not inevitably lend itself to a certain developmental stage or focus in life, it is the experiences and challenges faced by the individual. Whilst Erikson's model has been criticised for its staged approach, this study aims to use this idea in relation to Carstensen's work, to help understand the lifelong development and therefore, the impact an event such as a stroke might have in this, as well as how a person's age/stage may impact on their recovery.

On the whole, age is often associated with changes in perspective and motivation (Allemand, 2002), and when faced with a challenge, such as stroke, we are required to adapt and life focus can alter, perhaps due to such an event increasing in our awareness of time limitation and mortality (Hjemblink & Holmstrom, 2006).

#### **5.2.5. Coping and Adjustment**

Despite numerous challenges and obstacles associated with growing older, many adults go through their later years with a positive focus, engage in successful ageing (Laidlaw, 2008) and report being happy (Carstensen *et al.*, 2000). In a similar vein, older adults have shown resilience and the ability to implement psychosocial adjustments to cope with ageing, and the changes that accompany it (Laidlaw, WHOQOL Group, 2006).

The psychological strategies used by older adults have been conceptualised in a theory of adaptive development by Baltes and Baltes (1990). They postulated that gains and losses are experienced throughout life and that with age and the number of losses increases. The theory of Selective, Optimisation with Compensation (SOC) however, assumes that throughout life, a person's means

and goals change and these changes require there to be a selective re-allocation of resources, to optimise functioning. This model proposes a way in which people can successfully transition through different life stages, and has been shown as effective when used clinically with stroke patients with post stroke depression leading to an increase in levels of functioning (Laidlaw *et al.*, 2003).

Further to this theory, older adults have a lifetime of skills on which to draw on when faced with a challenge and when struggling to cope incorporating knowledge and wisdom (Baltes & Smith, 2003).

### **5.3.      *The role of context, perspective and perceptions***

At this point, we have established the wider context of stroke, and the role that ageing may play in a stroke survivors adjustment and experience of the recovery process. When assessing psychosocial development and how this relates to the outcome of stroke, looking closer at the role of perceptions and attitudes towards stage of life and significant life events, such a stroke may further understanding.

#### **5.3.1. Societal context**

Stroke and ageing occur within a societal context, and whilst the experience of the individual is pertinent, how they are responded to within the wider social environment is important.

In western society, there are perceptions and attitudes towards both ageing and chronic illness, which by and large, are negative. This is apparent in studies of 'ageism,' and the apparent connections people make to old age and ill health, being a time of loss and deterioration (Wentura & Brandstadter, 2003).

In a society where youthfulness is a sought after state, and in line with the prevalence of chronic illness in old age, those in earlier stages of psychosocial development are ill prepared for the challenges and experiences ageing brings.

Whilst some in society hold these negative perceptions of old age and older people, on entering the later stages of life, many people report positive perceptions towards age and report being happy (Carstensen *et al.*, 2000). Although looking at societal influences and perceptions is useful when gaining an understanding of the wider context, it is apparent that differences occur across age groups and between individuals. Further exploration of perceptions and attitudes at this individual level may provide a more in depth insight into the interaction societal influences, stage of life and individual experiences.

### **5.3.2. Individual perceptions and attitudes**

While the emotional experience of stroke for an individual, the impact of the event and the resultant changes to identity and life can impact on psychological well being, it can also affect outlook and perceptions of self and the environment (Sturm, 2002).

When working clinically with patients, in relation to physical and mental health, how a person perceives themselves and their environment is of great significance. More specifically, when working therapeutically with older adults with mental health difficulties and who are likely have additional physical health co-morbidity, consideration must be given between the difficulties, how the individual perceives their difficulties and the impact they have on their lives (Laidlaw *et al.*, 2003). Should an individual's perceptions of their difficulties not be taken into consideration when formulating, there would be limited understanding gained of what the person is going through and therapeutic intervention would suffer.

In relation to stroke, individual perceptions have been shown to be significant in post stroke rehabilitation and in those with post stroke depression (Broomfield *et al.*, 2010). From a psychological standpoint, when depressive symptoms do occur after a stroke, these symptoms are the expression of underlying processes, stemming from the person's own attitudes and perceptions of their stroke and how the stroke has impacted on their lives. In an effort to understand the

differences between individuals and how they respond to stroke, Lewis *et al.* (2001) investigated the impact that perceptions and attitudes can have on survival rates in stroke survivors. They reported an association between individual attitudes, such as 'helpless' and 'hopelessness' and survival rates. Whilst these findings supported previous research into negative attitudes affecting mortality rates in other physical health problems (Watson *et al.*, 1999), they did not find associations between all negative attitudes e.g. 'fatalism' and mortality.

Overall, the perceptions and attitudes that an individual holds are important, and when formulating difficulties, gaining an understanding of these has important theoretical and clinical implications. The specific individuality of perceptions and attitudes requires further investigation in the context stroke survivors and older adults.

## **6. AIMS AND HYPOTHESES**

This study primarily aimed to provide an insight into the stroke recovery process and the complex interactions surrounding each individual. Specifically, this study aims to investigate the role of attitudes to ageing and perceived quality of life and whether they are related to depression in stroke survivors.

Drawing on the theoretical underpinnings of attitudes to ageing and perceived quality of life in relation to depression, and the strength of the evidence from clinical research within the stroke population, the following hypotheses were made:

Hypothesis 1: Attitudes to ageing are negatively correlated with depressive symptoms

Hypothesis 2: Perceived quality of life is negatively correlated with depressive symptoms.

## **7. METHODOLOGY**

### **7.1.      *Design***

This study utilised a quantitative methodology, employing a cross-sectional design with each participant completing one questionnaire pack.

### **7.2.      *Participants***

Participants were patients who had experienced at least one stroke, and who were known to the NHS Lanarkshire Stroke Managed Clinical Network (MCN).

### **7.3.      *Inclusion criteria***

- Participants were aged 65 and over, and had experienced one or more strokes.
- All participants were community based, living in their own home, or in sheltered accommodation.
- Participants were known to NHS Lanarkshire MCN and to the stroke liaison clinical staff.
- Participants were required to have capacity to consent to participate in the study.
- Participants were able to understand the questionnaires and be able to provide verbal or written responses.

### **7.4.      *Exclusion criteria***

- Participants with a degree of cognitive impairment sufficient to impair capacity to take part in the research, based on the assessment and knowledge of the stroke liaison clinical staff involved.
- Participants who were acutely physically or mentally unwell.

## **7.5. Measures**

The measures selected for this study were decided to be appropriate for use with stroke population and to measure the theoretically relevant concepts being investigated. They were chosen to minimize response burden and to limit difficulty of completion for those taking part.

Attitudes to ageing of participants were measured using the Attitudes to Ageing Questionnaire (AAQ) (Laidlaw *et al.*, 2007). The AAQ is a standardised measure of attitudes and subjective perceptions of ageing, developed specifically for the older population. It has been developed and shown to be a valid and reliable measure, whilst also being cross culturally valid (Laidlaw *et al.*, 2007).

Respondents are asked to indicate on a 5-point Likert scale the extent to which they agree with a statement related to ageing. A total AAQ score can be derived from this questionnaire, with higher scores indicating more positive appraisals of ageing. In addition to this, the scale is comprised of a three factor structure, encompassing the domains psychosocial loss, physical change and psychological growth. The three domains sub-scale scores can be extracted from the measure, incorporating both negative and positive appraisals of the ageing experience.

Quality of Life was measured using the World Health Organisation-Quality of Life Questionnaire, Old version (WHOQOL- Old) (The WHOQOL Group., 2005.). The WHOQOL-Old is a standardised measure of quality of life in older adults and has been shown to be a reliable and valid measure of quality of life. Higher scores represent greater perceived quality of life in the participant. The scale is comprised of six facets, from which six subscales can be obtained. These facets include: 'Sensory ability' which assesses sensory functioning and the impact of the loss of sensory functioning on quality of life; 'Autonomy' aims to assess independence in old age and describes how much a person can live autonomously; 'Past, Present and Future Activities' describes satisfaction with life and things to be looked forward to; 'Social Participation' looks to measure participation in activities in the community; 'Death and Dying' related to concerns, worries and fears about death and the end of life ; and finally 'Intimacy'

which assessed the ability to have personal and intimate relationships (Power *et al.*, 2005).

Depression was measured using the New Multi-Dimensional Depression Scale (NMDS) (Cheung & Power, 2012). This is a newly developed assessment tool was designed to measure depression and evaluates the cognitive, somatic, emotional and interpersonal aspects of depression. Preliminary studies have shown the NMDS to be a valid and reliable measure of depression and severity of depression symptomatology (Cheung & Power, 2012). Despite this measure being newly developed, many alternative and widely used measures of depression do not evaluate interpersonal components of depression. This additional aspect of the scale was felt to be an important aspect and appropriate to be incorporated into this investigation, due to the rationale and topic being studied.

Demographic information was recorded on a data collection sheet designed for the study. Participants were asked to provide certain information about themselves including; age, gender, living situation, additional physical health problems, occupational/work history, whether they receive social support or are a carer for another. They were also asked about the areas of their life in which they believe stroke has had an impact, to rate their current activity levels, the time since stroke occurred, how many strokes they have had, and if they have previously suffered from depression. This additional information was collated to provide further context for each participant and to provide variables to be incorporated into the analysis.



## **7.6. Procedure**

### **7.6.1. Ethical approval**

Approval for the study was obtained from the University of Edinburgh Doctorate in Clinical Psychology Programme, regarding the design of the study. This was followed by consultation with The NHS Stroke Managed Clinical Network (MCN). Ethical approval was then sought from the West of Scotland Research Ethics Committee and the NHS Lanarkshire Research and Development department (see Appendix 1).

### **7.6.2. Recruitment**

The process began with the recruitment of individuals who were known the NHS Lanarkshire Stroke MCN clinical staff team. This team incorporates Stroke Liaison Nurses based across Lanarkshire, one Clinical Psychologist and one Young Stroke Support Worker. Clinical staff were made aware of the aims and rationale for the project, as well as the inclusion and exclusion criteria for participants. Clinicians were asked to identify potential participants from their current case load only, to ensure they were knowledgeable about the patient and were able to use clinical judgment as to whether the individual was appropriate to be approached to take part.

### **7.6.3. Approaching Potential Participants**

In line with their existing clinical work, clinicians informed those individuals who were deemed appropriate and who met the study criteria, about the study. They informed potential participants that the study was being conducted by a researcher out-with of their clinical care team and that they could decide in their own time whether to participate.

Individuals who were identified and who consented to be provided with further information were issued with a questionnaire research pack. This incorporated the contact details of the researcher and an additional health care professional should they discuss the study in more detail. This questionnaire research pack also included the participant information sheet (see Appendix 2), an invitation to

take part in the study (Appendix 2), the questionnaires, a pre paid envelope and an invitation to provide contact details to request feedback from the study. Those that wished to take part, however required assistance to do so, were encouraged to request assistance from a family member, friend, carer or to contact the researcher.

Individuals were requested to read the information regarding the study and to decide whether they would like to participate in their own time. At this point, potential participants were assured that information would remain anonymous throughout and that should they wish to receive feedback once they study is complete, this information would be kept separate to their questionnaires to ensure anonymity. Individuals wishing to take part were asked to complete the questionnaires and return the appropriate documents in the pre paid envelope. No consent form was utilised in this study, as should an individual wish to take part and do so, consent was implied.

#### **7.6.4. Communication difficulties**

From the criteria developed for this study, individuals who suffered from a language or communication difficulties were not excluded. Individuals who wished to participate but who required additional support to do so were encouraged to seek assistance from family, friends, carers or to contact the researcher directly so that arrangement could be made.

#### **7.6.5. Data storage and confidentiality**

The participants returned the forms in the pre paid envelope and the data was collated. If they participant had completed the optional form requesting for study feedback, this form contained participant identifiable information. These forms were therefore separated from the questionnaires and stored in a locked filing cabinet. The anonymised data from the questionnaires was then entered into a password-protected computer for statistical analysis.

Throughout the study, all personal information was treated in line with NHS Lanarkshire policies regarding confidentiality and data protection and the British Psychological Society code of conduct

### **7.7. Further ethical considerations.**

Taking part in this study involved completing questionnaires about mood, quality of life and to think about psychological aspects of the ageing process. Such topics may have the potential to cause distress and participants were therefore provided with a full explanation of the questionnaires and the nature of the topics being investigated.

This study provided a snap shot of an individual's functioning and due to this methodology being employed, no information was identifiable and participants were not followed up by the principal investigator. Participation in the study was in addition to the ongoing clinical intervention being carried out by the stroke liaison clinical team. All questions regarding mental health, and risk to self and others were in addition to the full risk assessment regularly carried out by the current clinical care team.

## **7.8. Statistical analysis**

All statistical analysis in this study was carried out using the Predictive Analytic Software (PASW), version 17.

Descriptive statistics were used to explore the sample characteristics of the participants. The analysis of the data was carried out in two stages. The first stage involved the association between the research variables being analysed: attitudes to ageing, depression and quality of life, using Pearson's correlational analysis, incorporating the demographic information to establish any associations. The second stage then incorporated a series of stepwise multiple regression analyses, with attitudes to ageing, depression and quality of life as the dependent variables.

### **7.8.1. Power analysis**

Previous studies in this area have reported correlations between a decrease in general health post stroke and depressive symptoms,  $r = 0.56$  (Bergersen *et al.*, 2010). A correlation between the non acceptance of disability following a stroke and depression of  $r = 0.46$  has been reported (Townend *et al.*, 2010) as well as a correlation between post (stroke) traumatic cognitions and depression  $r = 0.39$  (Field *et al.*, 2008.) Using these previously reported  $r$  values from the relationships being investigated, and to ensure sufficient power, an  $r$  value of 0.39 is indicated from the research. If assuming a 0.39 effect size, then a sample size of  $n = 46$  is therefore required (Clarke-Carter, 2004), testing at 5% significant level ( $\alpha 0.05$ ; power 0.80).

## 8. JOURNAL ARTICLE

An investigation into the role of attitudes to ageing, perceived quality of life and depressive symptoms in the stroke recovery process.

### **8.1. Abstract**

**Introduction:** Post stroke depression and perceived quality of life have been reported as pivotal in the adjustment process after stroke. Whilst many stroke survivors are within the over 65 age group, the ageing process adds an additional level of complexity to the difficulties faced by this population group of stroke survivors. In the face of increasing age and the resultant increase in challenges faced, positive attitudes are still held by many. To understand the stroke recovery journey further, the present study looks at attitudes to ageing in stroke survivors, and how such attitudes may predict difficulties with depression, whilst also considering the role of perceived quality of life

**Method:** This cross sectional study, assessed 47 stroke survivors aged 65 and over, using the Attitudes to Ageing Questionnaire (AAQ), the World Health Organisation Quality of Life, version for Older adults (WHOQOL-Old) assessment and the New Multidimensional Depression Scale (NMDS). Statistical analysis involved correlational analysis and further multiple regression analysis.

**Results:** The results showed that depressive symptoms post stroke, are negatively correlated with attitudes towards ageing and perceived quality of life. Additional analyses revealed that previous depression, perceived quality of life and perceived independence are moderating factors in the occurrence of PSD.

**Conclusion:** Older people, despite many challenges and losses faced, have the ability to overcome and adapt. In the presence of positive perceptions and attitudes, there is an increased resilience against depression in old age and in stroke.

**Key Words:** Post stroke depression, ageing, attitudes, stroke, older people, age, perceptions.

## **8.2. Introduction**

In recent years, there has been an increase in focus on the role of the individual and the impact of stroke on psychological well-being. Of those living with this chronic health condition, over two thirds are aged 65 and over (Stroke Association, 2008). This demographic picture of stroke and the implications for health care services and is further challenged by the current demographic shift in society, as the older adult population increases and longevity rates continually increase, in line with development in medical advances.

Whilst stroke is more likely to occur in the older population group, people over the age of 65 are also known to be at increased risk of additional health problems. Physically, old age is associated with a reduction in physical health (Beekman *et al.*, 1997), with resultant implications for mobility, independence and social functioning (Robinson, 2003). This also has further implications for clinical care, with much emphasis needed on functional and social gains.

Older people add a complexity that, from the point of view of health care professionals, requires the concept of age and the ageing process to be considered when trying to establish an understanding of the stroke journey.

### **8.2.1. Psychological factors**

From the perspective of both the individual and health professionals, identifying potential moderators of recovery and quality of life in stroke is an imperative part of, not only in understanding the experience of the stroke survivor, but also to inform health care and preventative and management strategies aimed at any difficulties which may arise. Therefore, psychological factors must be considered, particularly in light of post stroke depression (PSD) being one of the most referred to aspects of adjustment after stroke (Hackett *et al.*, 2005).

PSD is seen as a phenomenon due the prevalence rates, but also due to the lack of a consensus as to why it occurs. From a psychological perspective however, PSD has been shown to affect and predict perceived quality of life (Carod Artal *et al.*, 2000; Carod Artal *et al.*, 2009). Conversely, it has been suggested that it is an

individual's perceptions and appraisals that cause depressive symptoms (Field *et al.*, 2008) and in a study by Broomfield *et al.* (2010), negative attitudes and perceived quality of life have both been highlighted as risk factors for PSD. The combination of such factors presents a complex dynamic within which stroke survivors must negotiate the adjustment process, and where health care professionals must gain an understanding in order to provide the best level of care and support.

### **8.2.2. Perceptions of ageing**

Old age is a time associated with great loss, and when introducing the stroke population, and the inclusive older adult population in such a way, it is not difficult to see why there are a significant amount of negative attributions and perceptions surrounding the ageing process.

Old age is also seen by many as a time of deterioration, with people often reporting age in relation to images of frailty (Levy, 2003). These images, combined with the prevalence of physical health problems in older people, mean that these attributions are based on observations and factual information. These negative perceptions of old age and ageing in society are reflected in the term 'ageism,' which Ron (2007, p125) describes as "discrimination rooted in prejudice and generalisation towards people, based on their age." In western societies, ageism is rife, and in line with the demographic changes afoot, the impact of such attitudes is likely to have an increasingly detrimental impact on individuals living in societies with such stereotypes.

Interestingly, holding negative attitudes toward age does not exclude those in the older population (Hummert *et al.*, 1994). Despite these negative attitudes and perceptions of ageing having potentially harmful consequences and impacting on well being (Rothermund & Brandtstadter, 2003), older people do hold these self-perceptions.

Research into the influence of older peoples self-perceptions as they age, has explored several explanations as to why this trend occurs. In a study by Kotter-

Gruhn *et al.* (2009) self-perceptions of ageing were identified as a multidimensional construct, comprising facets such as 'ageing satisfaction' and 'subjective age,' and their roles in age identity. Additionally, Rothermund and Bradtstader (2003) explored self perceptions of ageing within a cognitive theory of ageing framework, hypothesising the role of a "contamination hypothesis" suggesting that people gradually incorporate stereotyped views into their personal views over time. Whilst individuals hold these negative attitudes as they themselves become older, others do not. Therefore, the role that such varying attitudes play in the context of well-being and mental health requires exploration on an individual level.

### **8.2.3. The role of life span development**

In the context of theories of ageing and Erikson's theory of psychosocial development (Erikson, 1963), the presence of negative perceptions may be in response to the uniquely human awareness of the time limited nature of life (Hjelmblink & Holmstrom, 2006), in conjunction with experiences of family members ageing and the inevitability of getting older. Using Erikson's framework, these struggles could occur because of the current standpoint in life, and having not yet entered a later psychosocial stage of development. A person would therefore be unprepared to adapt and cope, using skills utilised in earlier stages of life, which are not as effective at this later stage, for example, problem solving and productiveness. It is suggested that this would have implications for a person's ability to cope with such certainty and impact on their perceptions of themselves, perhaps resulting in poorer mental health.

Whilst negative ageing perceptions and self-perceptions exist in society, not everyone holds these negative opinions or struggle with mental health problems in old age. In fact, many older people are reported to engage in successful ageing (Boudiny, 2012), remaining positive about their lives (Jacobs, 2004). Perhaps this is due to the fact that, as an age group, older people are thought to be the most diverse. Therefore older people may be least affected by social influences like conformity, as other age groups may be, where there is an increased motivation to 'fit in', such as is seen in the teenage population.



Even if a person held previously negative views on ageing, once the individual themselves enter the later stages of life, adapting these previous perceptions and adopting attitudes that are unified with their experiences may occur, in line with cognitive dissonance theory (Festinger, 1957).

#### **8.2.4. Perceptions as an important consideration**

A key consideration here is the role of self-perceptions of an individual. It has been suggested that high levels of stability in self-perceptions of ageing are indicators of resilience and demonstrate adaptations to stressors (Sneed & Whitmore, 2005).

Within the context of health care, self-perceptions and self reported mental health are the measures against which perceived health and the success of health care initiatives are increasingly being based upon. This is the case in stroke, with clinical research and health care professionals making an effort to establish the well being and perceived quality of life of stroke patients to inform care, person centred rehabilitation, and to gain an insight into the potential moderators of depression and well being after stroke.

### **8.3. Aims**

The role of perceptions and attitudes towards ageing has been established as an important aspect in the stroke experience. The aim of this study was to explore the role of attitudes to ageing and perceived quality of life in stroke survivors and whether they are related to post stroke depression. Furthermore, the role of demographic context and patient characteristics are investigated, with the aim of exploring further moderating factors in post stroke depression, to facilitate a fuller understanding of the stroke experience.

### **8.4. Hypotheses**

Hypothesis 1: Attitudes to ageing are negatively correlated with depressive symptoms

Hypothesis 2: Perceived quality of life is negatively correlated with depressive symptoms.

## **8.5. Method**

### **8.5.1. Participants**

Forty-seven stroke patients took part in this study, all of whom were currently known to the NHS Lanarkshire, Stroke Managed Clinical Network. Those who participated were aged 65 or over, had experienced one or more strokes, and were residing in the community. Participants with physical and/or communication difficulties were included on the study, however based on the clinical opinion of the clinical care team, those who were acutely physically or mentally unwell, or with a degree of cognitive impairment sufficient to impair capacity to take part in the research were excluded.

### **8.5.2. Measures**

**The attitudes to ageing questionnaire (AAQ)** (Laidlaw *et al.*, 2007) is a standardised measure of attitudes and subjective perceptions of ageing, developed by the WHOQOL Group, specifically for use with older adults. It has also been shown to be a cross culturally reliable and valid measure due to the WHOQOL Group methodology, with robust psychometric properties (Cronbach's alpha for total score  $\alpha=0.86$ {Laidlaw *et al.*, 2007}). The measure is comprised of 3 subscales, each addressing different facets of ageing and aimed at eliciting both positive and negative perceptions of ageing. Psychosocial loss, Physical change and Psychological growth incorporate perceptions of psychological and social loss, the experience and exercise, and wisdom and growth during ageing. Total score and subscales scores for each domain can be calculated, with higher scores signifying more positive perceptions and attitudes.

**The WHOQOL-Old questionnaire** (The WHOQOL Group, 2005) is also a standardised scale developed purposefully for use with the older adult population. The scale measures perceived quality of life in older adults, and includes six subscales all measuring different domains of quality of life: sensory abilities; autonomy: past, present and future activities; social participation; death and dying; and intimacy. Again both the total and subscale scores can be calculated with higher scores indicating increased levels of perceived quality life.

As mentioned, this scale is suitable for use with older people and has been demonstrated as psychometrically robust (Cronbach's alpha for subscales ranging from  $\alpha=0.72$  to  $\alpha=0.88$ , with a total score displaying a consistency coefficient of  $\alpha=0.89$ ). The scale has also reportedly shown convergent validity with other subjective health related measures (The WHOQOL Group, 2005).

**The new multidimensional depression scale (NMDS)** (Cheung & Power, 2012), is a newly developed tool for assessing depression symptomatology. Whilst it has not been developed exclusively for the older adult population, preliminary testing shows it to be a valid and reliable measure, with Cronbach's alpha for total scale score  $\alpha=0.87$ , suggesting internal consistency/reliability (Cheung & Power, 2012). In addition to this, a high correlation was also found between the NMDS and the Beck Depression Inventory II (BDI-II) ( $r=0.77$ ,  $p<0.01$ ). This measure was selected as it too incorporates subscales, in addition to an overall score. Four different facets of depression; emotional, cognitive, somatic and interpersonal are incorporated, and subscales for each can be elicited, with higher scores indicating increased depressive symptoms.

### **8.5.3. Procedure**

Ethical approval was sought out from both the University of Edinburgh Doctorate of Clinical Psychology Programme, the West of Scotland Research Ethics Committee and the NHS Lanarkshire Research and Development department. On approval being given, relevant staff within the Stroke MCN were made aware of the study, its rationale and criteria for participation. The different members of the stroke team then approached various potential participants from their existing caseloads, to inform about the study and if appropriate, provide those willing to take part with a research pack. All potential participants were informed of the study being carried out in liaison with the stroke service, however by a researcher out with their current clinical care team.

The research pack provided to participants included the three outcome measures above, and an additional request for demographic information. Once completed, questionnaires were returned to the researcher for analysis. Due to

this methodology, consent to take part was implied. During the process, participants were encouraged to contact the researcher should they have any questions about the study, taking part or if they required any assistance

#### **8.5.4. Analysis**

The questionnaire data was analysed by using Predictive Analytic Software (PASW) version 17. Descriptive statistical data was calculated for all scales within the AAQ, WHOQOL-Old and NMDS measures. In the first stage of analysis, Pearson's correlation coefficient analysis was applied to establish any associations between the data. A second stage then incorporated a multiple regression analysis, using the main outcome, depression scores as the dependent variable.

Using existing association established in the data between the variables being investigated, and to ensure sufficient power, an  $r$  value of 0.39 is indicated from the research. If assuming a 0.39 effect size, then a sample size of  $n = 46$  is therefore required (Clarke-Carter, 2004), testing at 5% significant level ( $\alpha = 0.05$ ; power 0.80).

## **8.6. Results**

### **8.6.1. Demographics**

Of a total sample of 47, the mean age of participants was 71.68 years (range 65-82, SD = 4.602). Over half of those who took part were male (55%, n= 26), and more than half of the sample had suffered from 1 stroke (53%, n=25). Full characteristics of the sample are summarized in Table 3.

**Table 3. Sample Characteristics**

		n = 47	%
<b>Gender</b>	Male	26	55
	Female	21	45
<b>Living situation</b>	Alone	12	26
	With partner/spouse	33	70
	With family	2	2
<b>Physical health</b>	Diabetes	4	8
	Hypertension	19	40
	CV disease	12	25
	Arthritis	20	42
	High cholesterol	23	49
	Other	13	28
<b>Occupation history</b>	Retired teacher/professional	6	13
	Retired skilled tradesman	9	19
	Retired skilled mechanical	2	4
	Retired customer service	4	9
	Retired admin/clerical	6	13
	Retired no detail	17	36
<b>Social support</b>	Friend/family/carers	32	68
<b>Carer</b>	Family/friend	6	13
<b>Stroke impact on life</b>	Mobility	37	79
	Independence	23	49
	Financial	14	30
	Other	10	21
<b>Activity levels</b>	Extremely low	3	6
	Quite low	23	49
	Ok	19	40
	Quite high	2	4
	Very high	0	0
<b>Time since stroke</b>	<3 months	6	13
	3-6 months	8	17
	6-12 months	16	35
	1-2 years ago	14	31
	>2 years ago	2	4
<b>Number of strokes</b>	1	25	53
	2	13	28
	3	8	17
	4	1	2
<b>Mental health</b>	Previous depression	12	26

n =number of participants. % =percentage of total sample

The mean scores for the AAQ, QOL and NMDS were all calculated, along with the mean scores for the different subscales within each measure. Full descriptive statistics of the main outcome variables are provided in Table 4.

**Table 4. Descriptive statistics summary of AAQ, NMDS and QOL measures**

		Mean	Max score	Range	SD
<b>AAQ</b>	Total score	77.21	120	53-96	10.50
	Psychosocial loss	28.02	40	11-38	6.71
	Physical change	21.55	40	13-29	4.37
	Psychological growth	27.64	40	18-35	3.89
<b>NMDS</b>	Total depression score	110.06	260	54-167	33.68
	Emotional	25.55	60	12-49	9.92
	Cognitive	31.66	80	16-53	11.31
	Somatic	29.89	60	13-46	9.04
	Interpersonal	22.96	60	12-47	8.47
<b>WHO QOL</b>	Total QOL score	82.40	120	54-100	10.60
	Sensory ability	14.74	20	8-20	3.68
	Autonomy	13.11	20	4-18	2.48
	Past/present/future activities	13.34	20	8-20	2.48
	Social participation	12.43	20	7-20	2.65
	Death Dying	14.79	20	5-20	4.59
	Intimacy	14.00	20	4-20	5.27

SD = standard deviation. Max poss score = presented the highest possible score obtainable in the given scale.

### **8.6.2. Stage 1: Analysis of associations**

A preliminary analysis of the data using parametric and non-parametric tests was carried out to determine the normality and distribution of the data. This led to parametric tests being deemed appropriate for use in the analysis of the data.

Relationships between the three main variables: Depression score (NMDS), Attitudes to Ageing score (AAQ), and Quality of life score (QOL) were examined, along with the subscales contained within each measure (see Table 5).

Furthermore, the relationships between NMDS, AAQ, QOL and the demographic information were examined, incorporating stroke-specific factors and physical health factors (see Appendix 5,6 and 7). The demographic information was then investigated for inter correlations between the variables (see Appendix 8).

#### **8.6.2.1. Relationships between the research variables**

##### **AAQ, NMDS and QOL**

In line with the hypotheses, there were negative correlations found between total AAQ scores and total NMDS scores ( $r = -.352$   $p = 0.015$ ) and also between total QOL and NMDS score ( $r = -.530$   $p < 0.001$ ). Whilst in addition to this, a positive correlation was found between total AAQ scores and total QOL score ( $r = .650$   $p < 0.001$ ).

##### **AAQ, NMDS and QOL subscales**

The subscales from the three main outcomes measures were also analysed. This incorporated the following: AAQ subscales; psychosocial loss, physical change and psychological growth: the NMDS subscales; emotional, cognitive, somatic and interpersonal: and the QOL subscales; sensory, autonomy, activity, social, death and dying and intimacy.

Psychosocial loss was negatively correlated with several other subscales including emotional, cognitive and interpersonal depression scores (emotional  $r = -.690$ ,  $p < 0.001$ ; cognitive  $r = -.680$ ,  $p < 0.01$ ; interpersonal  $r = -.316$ ,  $p = 0.03$ ). It was however, positively correlated with sensory and intimacy scores ( $r = .430$ ,  $p = 0.003$ ;  $r = .349$ ,  $p = 0.016$ ), as well as with activity and social scores ( $r = .378$ ,



p.009;  $r=.619$   $p<0.001$ ). Whilst psychological growth was positively correlated with somatic and autonomy scores ( $r=.288$ ,  $p=.049$ ;  $r=.378$ ,  $p=.009$ ), physical change scores were positively related to social and death and dying scores ( $r=.511$ ,  $p<0.001$ ;  $r=.316$ ,  $p=.030$ ).

Of the other NMDS and QOL subscales, emotional scores were negatively associated with sensory, activity and social subscales ( $r=-.326$ ,  $p=.025$ ;  $r=-.307$ ,  $p=.036$ ;  $r=-.479$ ,  $p=.001$ .) The cognitive subscale was negatively correlated with sensory, social and death and dying subscales ( $r=-.447$ ,  $p=.002$ ;  $r=-.477$ ,  $p=.001$ ;  $r=-.323$ ,  $p=.027$ ), whilst the somatic subscale was also shown to be negatively related with death and dying scores ( $r=-.330$ ,  $p=.24$ ). The final depression subscale, interpersonal was negatively correlated with both social and sensory QOL subscales ( $r=-.370$ ,  $p=.010$ ;  $r=-.370$ ,  $p=.010$ ).

**Table 5. Associations between AAQ, Depression scores (NMDS) and WHO QOL totals and subscales.**

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Total AAQ	-															
2	AAQ Psych loss	.741**	-														
3	AAQ Phys change	.763**	.258	-													
4	AAQ Psych growth	.564**	-.017	.490**	-												
5	Total Dep	-.352*	-.588*	-.145	.228	-											
6	Dep Emotional	-.432**	-.690**	-.100	.139	.923**	-										
7	Dep Cognitive	-.455**	-.680**	-.176	.145	.961**	.945**	-									
8	Dep Somatic	-.161	-.285	-.206	.288*	.744**	.540**	.602**	-								
9	Dep Interpersonal	-.114	-.316*	-.003	.241	.814**	.659**	.734**	.451**	-							
10	Total QOL	.650**	.553**	.406**	.343*	-.530**	-.537**	-.618**	-.162	-.478**	-						
11	QOL Sensory	.305*	.305*	.045	.030	-.367*	-.326*	-.447**	-.093	-.382**	.571**	-					
12	QOL Autonomy	.223	.223	.049	.378**	.033	-.016	-.014	.138	.024	.475**	-.051	-				
13	QOL Activity	.378**	.378**	.210	.244	-.263	-.307*	-.246	-.153	-.195	.519**	.095	.623**	-			
14	QOL Social	.619**	.619**	.511**	.210	-.443**	-.479**	-.477**	-.180	-.370*	.508**	.045	.372**	.594**	-		
15	QOL Death dying	.157	.157	.316*	.101	-.378*	-.253	-.323*	-.330*	-.423**	.287	.151	-.096	-.262	-.105	-	
16	QOL Intimacy	.349**	.349*	.111	.157	-.142	-.220	-.265	.110	-.071	.576**	.257	.050	.114	.103	-.159	-

\*correlation is significant at 0.05; \*\*correlation is significant at 0.01

### 8.6.2.2. Demographic relationships

Demographic information was then analysed using Pearson's correlational analysis to determine any significant correlations (See Appendices 5, 6, 7 and 8 for tables).

#### Demographic information and outcome variables

A significant correlation was found between activity levels and several of the outcome measures; total AAQ ( $r = .441, p = 0.002$ ), physical change ( $r = .618, p < 0.001$ ), total NMDS ( $r = -.312, p = 0.033$ ), somatic ( $r = -.369, p = 0.011$ ), total QOL ( $r = .326, p = 0.026$ ) and social scores ( $r = .549, p = 0.000$ ).

Social support was found to be related to physical change ( $r = .429, p = 0.003$ ), whilst number of strokes suffered was correlated with physical change and autonomy ( $r = -.420, p = 0.003$ ;  $r = .303, p = 0.038$ ).

Previous depression, prior to stroke, was significantly correlated with factors total QOL, psychosocial loss and social scores ( $r = .341, p = 0.019$ ;  $r = .384, p = 0.008$ ;  $r = .339, p = 0.020$ ). Interestingly, previous depression was also negatively correlated with all depression subscales, including total score, emotional, cognitive, somatic and interpersonal ( $r = -.651, p < 0.001$ ;  $r = -.608, p < 0.001$ ;  $r = -.672, p < 0.001$ ;  $r = -.542, p < 0.001$ ; and  $r = -.399, p = 0.006$ ).

With regards to the impact of stroke on aspects of an individual's life, independence was negatively correlated with total NMDS, emotional, cognitive and somatic depression scores ( $r = -.455, p < 0.001$ ;  $r = -.383, p = 0.008$ ;  $r = -.410, p = 0.004$ ; and  $r = -.535, p < 0.001$ ). Conversely, it was positively related to total AAQ, psychosocial loss, physical change, social and death and dying scores ( $r = .319, p = 0.029$ ;  $r = .298, p = 0.042$ ;  $r = .342, p = 0.019$ ;  $r = .323, p = 0.024$ ;  $r = .329, p = 0.024$ ). Mobility and finances are two additional areas that may also be affected by stroke and they were found to be related to physical change ( $r = .294, p = 0.045$ ;  $r = .417, p = 0.004$ ) and death and dying subscales ( $r = .299, p = 0.041$ ;  $r = .358, p = .013$ ).

Physical health was also considered and any correlations between several health related problems and the various outcome scales were examined. Negative correlations were found between high cholesterol and psychological growth, total QOL, autonomy and activity subscales ( $r=-.413$ ,  $p=0.004$ ;  $r=-.412$ ,  $p=0.004$ ;  $r=-.487$ ,  $p=0.001$ ;  $r=-.322$ ,  $p=0.023$ ). In addition to this, negative correlations were also apparent between hypertension and variables; total AAQ, psychosocial loss and total QOL ( $r=-.346$ ,  $p=0.017$ ;  $r=-.311$ ,  $p=0.034$ ;  $r=-.294$ ,  $p=0.045$ ). Interestingly, there was a further positive correlation found between CV disease and total AAQ ( $r=.303$ ,  $p=0.038$ ).

### **Inter-correlations between variables**

The findings showed several relationships of note, pertaining to activity levels; the amount of social support received was positively correlated with reported activity levels ( $r=.447$ ,  $p=0.002$ ). Furthermore, activity levels were correlated with several other variables; number of strokes ( $r=.404$ ,  $p=0.005$ ), time since stroke ( $r=.407$ ,  $p=0.005$ ), independence ( $r=.364$ ,  $p=.012$ ), stroke impact on finances ( $r=.341$ ,  $p=0.019$ ) and occurrence of CV disease ( $r=.296$ ,  $p=0.043$ ).

Other significant correlations that were found included social support being correlated with independence, stroke impact on finances and mobility ( $r=.305$ ,  $p=0.037$ ;  $r=.446$ ,  $p=0.002$ ; and  $r=.425$ ,  $p=0.003$ ). It was also found that previous depression was related to independence and living situation ( $r=.305$ ,  $p=0.037$ ;  $r=.432$ ,  $p=0.002$ ).

### 8.6.3. Stage 2: Regression analysis

To extend the correlational analysis, and to establish how other factors may predict depression scores, a stepwise multiple regression analysis was conducted with depression as the dependent variable.

In this analysis, a significant model emerged. Previous depression was entered first and explained 42.3% of the variance in NMDS scores ( $F_{1,45}=33.028$ ,  $p<0.001$ ). Next, total QOL was entered and explained an additional 10.8% of the variance in scores ( $F_{1,44} = 10.050$ ,  $p=0.003$ ). Independence scores were then entered and explained a further 5.8 % of the variance in NMDS scores ( $F_{1,43} = 6.177$ ,  $p=0.017$ ). Therefore, previous depression, quality of life scores and independence were identified as predictors for depression in stroke survivors (see Table. 6).

**Table 6. Stepwise Multiple Regression: Predictors of Depression (NMDS)**

	Model R <sup>2</sup>	B	Std Err	$\beta$	t	Sig
<b>Model 1</b>	0.42					
Constant		196.79	15.56		12.65	.001
Prev dep		-49.71	8.65	-.65	-5.75	.001
<b>Model 2</b>	0.53					
Constant		274.85	28.42	-.53	9.67	.001
Prev dep		-40.63	8.40	-.39	-4.84	.001
Total QOL		-1.14	0.36		-3.17	.003
<b>Model 3</b>	0.59					
Constant		285.28	27.21		10.49	.001
Prev dep		-35.23	8.23	-.46	-4.28	.001
Total QOL		-1.07	0.34	-.33	-3.13	.003
Independence		-17.06	6.86	-.26	-2.49	.017

Only significant predictors are included here; Std Err B= standard error of B;  $\beta$  = Beta

## **8.7. Discussion**

The main aim of this study was to explore the role of attitudes to ageing and perceived quality of life, specifically in the context of post stroke depression and whether these factors play a role in the occurrence of PSD. Whilst old age is a time associated with great loss, and a stroke can often leave an individual changed in many ways, the findings suggest that negative attitudes towards ageing and reduced quality of life are both related to an increase in depressive symptoms.

In the context of old age and chronic illness, societal perceptions lend themselves to the assumption that an individual would be negatively affected by a stroke in later years of life. This research suggests however that, whilst there is a relationship between individual perceptions of age and well-being, and the outcome of stroke, particularly in relation to mental health, negative outcomes in recovery are not inevitable.

### **8.7.1. Influence of perceptions on adjustment and outcome**

Similarly to the findings of Carod-Artal *et al.* (2009), the analysis found a relationship between perceived quality of life and depressive symptoms, In addition to this relationship however, perceived quality of life was found to explain a degree of the variance in depression scores and was highlighted, along with other variables, as a predictor of depression. This replicates findings by Haley (2011) who investigated this same relationship and found that it was reduced quality of life that predicted and increased the risk of depressive symptoms in stroke survivors. Conversely, in Carod-Artal *et al.* (2009), it was concluded that it was depression that was the predictor of quality of life, which was further supported by findings in Froes *et al.* (2011). The direction of causality within the literature is often unclear and cyclical in nature, however studies agree on the presence of a relationship, with findings reflecting the close relationship between perceptions and depression.

In clinical terms, the direction of causality is perhaps less important than gaining an understanding of a person, their difficulties and identifying how to meet their

needs. However, to ensure health care and rehabilitation approaches are continually informed, this warrants continued investigation into the different facets of an individual, such as perceptions and attitudes, which can impact on recovery.

Due to the apparent importance of perceptions in the recovery process, and in light of the demographics of the stroke population, establishing an understanding of the role that perceptions and attitudes towards ageing can add to this, already complex interaction, was felt to provide a deeper understanding of the stroke experience.

This study showed that perceptions and attitudes to ageing have a role in the recovery journey of strokes survivors, particularly in the context of mental health. To establish an understanding of why this may occur it is useful to draw on literature on the ageing process. During ageing, possibly with the onset of deterioration of physical health, individuals become more aware of their own mortality and a change is thought to occur in future time perspective (Carstensen, 1993). This same idea can be applied in stroke, as such a sudden and significant event has implications, causing an increased awareness of life as time limited. In the Socio-Emotional Selectivity Theory (Carstensen, 1993), it is proposed that in reaction to the shift in future time perspective, focus changes from a practical, gains orientated focus, to that of a present orientated and emotion related focus. In the context of stroke survivors, this study showed a relationship between higher levels of intimacy and relationships, in those with fewer mental health difficulties following stroke, perhaps highlighting the emotion focus associated with later stages of life. This emotion focus has implications for many aspects of an individual's life, including personal drives and goals for the future. Such a shift in perspective and motivation also has implications for the rehabilitation process taking place after a stroke, when people are rebuilding their lives, and highlights the importance of a person centred rehabilitation focus that is tailored to their own individual rehabilitation goals.

### **8.7.2. Perceptions as protective factors**

Whilst research has established a link between attitudes and perceptions, in the context of ageing (Chachamovich *et al.*, 2010) and stroke (Townend *et al.*, 2010), this study suggests that attitudes and perceptions may also have a role as protective factors against mental ill health. In line with this existing research, attitudes and perceptions have been found to be related to the acceptance of physical health and beliefs about the future (Haaga, 1991), as well having implications on mortality rates (Lewis *et al.*, 2001). The role of positive attitudes and perceptions therefore may be key in promoting recovery.

It is suggested that, as people age, they become better adapted to coping with adversity, as resources for adjustment become more effective over time (Clarke & Black, 2003) and people have a lifetime of cumulative resources and life experience to draw upon. In the context of an older age group, it is known that physical health and chronic conditions increase exponentially across the lifespan. Therefore, if faced with a stroke, previous experience with such stressors builds a robust belief in a persons own competence for coping with adverse events (Boehmer, 2007). This may hold particularly true for the current cohort of older people, many of whom lived through the adversity of WW2 and the impoverished times that followed. The current study supports this idea, as individuals who have suffered from depression prior to their stroke were identified as less likely to report PSD symptoms, perhaps due to being better equipped to deal with the consequence of such an event. From a life span perspective, resources have been built up over time and people are developmentally prepared, therefore age in itself may also be a protective factor.

Clinical implications of these findings suggest that whilst there may still be the existence of negative perceptions towards older people in health care settings (Kane, 1999), in many cases, older people in are in fact well equipped and able to respond and adapt to challenges faced. Interestingly, a previous episode of depression is often considered to be a risk factor for future presentations, however, the findings of this study suggest otherwise.



### **8.7.3. Further consideration of the role of loss in ageing and stroke**

Whilst stroke recovery is often perceived in terms of gains made, and the progression through stages of rehabilitation, there are inevitably losses that come with such an experience. Consequences of this can leave a person changed in many ways, in terms of physical, emotional and cognitive functioning, and in addition to this impacting on interpersonal and social aspects of life.

Additionally, old age generally is a time associated with increasing amounts of loss, for example, of health, mobility, independence, a sense of purpose and usefulness and peer group, and when combined with stroke can lead to difficulties with coping and adjustment (Ron, 2007).

When faced with a critical incident, such as stroke, from a life span perspective a person is confronted by an unexpected and unanticipated challenge. Erikson's Theory of Life Span Development (1963) suggests that this type of challenge would result in a forced transition into a later stage of development, specifically from the productivity driven stage 7 into the emotionally driven stage 8 in the original model, or even into the transcendence of stage 9 with frailty in the addition added in 1998 (Erikson, 1998). This turning point in life leaves little time for preparation, and developmentally a person may not be ready. The experience of loss and grief in such a situation would therefore be anticipated, as feelings of despair can occur, in light of being unable to resolve the challenges of stage 8 and as the perception may be that life is nearing its end. Such a perception and degree of unpreparedness may be due to a person drawing on the coping strategies that worked in stage 7 i.e. practical problem solving, striving for productivity. Their attempts to cope in this next stage are therefore unsuccessful, which can be related to the denial stage of loss and may go some way to explain the increased likelihood of depressive symptoms, as found by Gbiri *et al.* (2010).

When working clinically with depression after stroke, the importance of loss has been identified as an important consideration (Broomfield *et al.*, 2010). If addressing depressive symptoms in such a context, then an emphasis is needed on coming to terms with events and working towards being able to adjust. In a

study by Dowswell *et al.* (2000), they found that recovery from stroke is often perceived by the individual, in terms of the degree of congruence with their pre stroke self. When comparisons are made between pre and post stroke, it is likely that many losses will be experienced and post stroke adjustment may be affected, with the need for attention to be paid to making sense of the losses encountered.

When faced with stroke in old age, it is perhaps naïve to anticipate that an individual's well being will not be impacted to some degree during the journey of recovery, and as the literature shows, both stroke and old age have been shown to play a role in perceived quality of life (Carod-Artal *et al.*, 2009; Chachamovich *et al.*, 2010). The results of this study take this further, suggesting different facets of depression; emotional, cognitive and interpersonal, all play a part in recovery from stroke, and are linked with increased psychosocial loss and negative perceptions.

Although not all stroke survivors experience depression, post stroke depression is known to be a common occurrence, particularly in the first years after stroke (Kneebone & Dunmore, 2000). Whilst the research has identified the increased risk of depression occurring after stroke, an understanding of the depressive symptoms varies, with studies using symptoms, clinical diagnosis and outcome measure cut off scores to screen for any difficulties. In Chachamovich *et al's study* (2010), major depression and subsyndromal symptoms of depression were assessed in relation to perceived quality of life and attitudes to ageing in older people. They reported that, even relatively minor levels of depression are associated with a decrease in quality of life and patterns of negative attitudes towards ageing. Although this study did not take into account the specific diagnosis, it supports the suggestion that depression is not a straightforward construct to quantify, raising a further query about how depression is conceptualised. Using the analogy of loss and the idea of working through stages of grieving to accept loss, this offers an explanation of the psychological processes that occur in post stroke adjustment. If depression is thought about in this way, it may therefore be a healthy process to engage in during a period of

adjustment and any psychological interventions would need to take a different form, to avoid the possibility of pathologising the depression.

At this point, further in depth analysis is required of the depression experienced by both older adults and stroke survivors, to further understand any moderating factors and the impact such mental health difficulties can have in these contexts.

#### **8.7.4. Additional implications of findings**

The role of perceptions and attitudes has been emphasised in the findings as important for predicting depressive symptoms after stroke. Currently, the focus of clinical care and policy drivers in stroke are around education and providing information for the public and patients. In light of the current findings, there may be role for incorporating challenging of perceptions in both direct clinical work and in the wider context. As perceptions were found to may be a moderating factor, challenging these perceptions, in line with existing CBT evidence based practice should be encouraged in work with stroke survivors and older adults.

#### **8.7.5. Strengths and weaknesses**

This study was the first to the authors' knowledge, focused on gaining an understanding of how the ageing process and attitudes towards this process, from the age group with the most intimate knowledge of this stage of life, can predict and how both are related to PSD. In addition to this, the study incorporated many of the additional variables and confounding factors, often referred to in the literature, to enable a wider consideration of a person's context in the analysis. This study did not however consider the role of fatigue in stroke. This is an important aspect of stroke to consider, particularly in light of the implications it can have on the rehabilitation and adjustment process, and should be incorporated in further research.

A further limitation of this study was the use of a cross sectional design, which has inherent limitations for interpretation, not allowing inferences of causality to be made. What's more, the outcome measures were all subjective which does not allow for an objective measure of difficulties. Although this is a limitation of

this study, when trying to gain an understanding of perceptions and attitudes, then subjective outcome measures are well placed.

Whilst this study aimed at collecting additional demographic and stroke specific information, in conjunction with the outcome measures, it is acknowledged that there were variables which could not be fully explored. Previous depression was found to be a key predictor for depressive symptoms, however no information was gathered on the specific nature of the depression, which would have provided further useful information in the interpretation of results.

#### **8.7.6. Further research**

In light of the findings around the role that perceptions and attitudes have in occurrence of depressive symptoms in stroke recovery, further analysis should incorporate the use of a longitudinal design. Clinically, establishing how these factors may be related over time would allow for more detailed identification of potential moderators of emotional distress, further informing the role of preventative support and clinical care for stroke patients and older adults alike.

Additional research should also incorporate the findings of previous depression as a protective factor against depression, exploring the nature of the pre stroke depression, and the importance of fatigue experienced following stroke, to further establish the role of these factors in people's perceptions and attitudes.

Finally, much of stroke research focuses on the first few years after a stroke has occurred. Whilst this is a time of great change and an important time in which health professionals need to improve their understanding, both research and clinical findings highlight stroke as a long term condition. Research looking at the more long-term outcomes for stroke survivors is needed to provide a fuller understanding of the impact stroke and PSD has on the life cycle.

## **8.8. Conclusions**

As people age, they are inevitably faced with an increasing amount of challenges to overcome, and stroke is one of many that become more prevalent in the later years of life. Whilst research has shown the importance of an individual's perceptions when coping along the way, depression and other consequences still occur in many people. From a clinical perspective, to provide support and preventative strategies, gaining an insight into the impact of stroke and what factors may moderate the recovery process is imperative.

The results of this study support the notion that, despite being faced with increasing age and stroke, older people have gained experiences and coping strategies throughout the life course, preparing them for such challenges. More specifically, in the context of depression and PSD, older people who have suffered from previous depression pre stroke, are less likely to suffer from depressive symptoms post stroke. Whilst losses are experienced and difficulties such as depression overcome, previous experience, positive perceptions and attitudes are associated with resilience and ultimately better outcomes in the recovery process.

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## 9. ADDITIONAL DISCUSSION

A further point of discussion builds on the inconsistent use of terminology within the literature. Whilst examining relevant papers within the subject, there were many different references made to 'depression' and to 'quality of life,' and a reader must exercise caution when interpreting what construct is being referred to. More specifically in terms of depression, this was described in several ways: 'depressive symptoms', 'major clinical depression', 'mild depression' and 'subsyndromal depression' are all used. Whilst some researchers provide definitions and explicitly state what they mean by depression, e.g. using diagnostic criteria, at times the core meaning and what is being examined can be unclear.

With this in mind, this methodology attempted to elicit different components of 'depression,' to allow for a deeper examination of a person's difficulties. During interpretation within the context of the theories and concepts discussed however, the complexity of the term 'depression' was made more apparent, as was the different conceptualisations of depression within the literature.

Whilst depression is a widely discussed aspect of mental health, caution must be taken as terminology can be left lacking a degree of clarity. Future efforts should be made when defining depression, to incorporate an explanation of the specifics of the construct being investigated. This is of particular relevance within stroke, where PSD plays such a pivotal role in many people's recovery process.

## 10. OVERALL CONCLUSIONS

The experience of stroke in the later years of life is a challenge faced by many older adults in our society. Whilst there are negative attitudes held by members of this society towards older people, and by the individuals themselves, it is apparent that there are many who report to be ageing 'successfully.'

Through the ageing process, people continually develop and adapt, responding to challenges faced through the life span, with one example being that of stroke.

In the stroke aftermath, there is often a requirement to adapt and adjust for each stroke survivor. And whilst there are elements that may be permanently changed, gains can be made and perceptions of the self and others can be positive.

Inevitably, during the ageing process and following a stroke, there will be losses suffered by most and these can have consequences for recovery and for the adjustment process, with many stroke survivors reporting depression and other difficulties.

Ultimately, positive perceptions and attitudes are thought to play a pivotal role in how people cope and adjust, with the findings of this study highlighting the role they, and previously overcome difficulties, can play as protective factors against mental health problems. These findings have implications for the direction of clinical work and for ongoing and future public awareness campaigns around stroke.

Finally, from a theoretical and clinical perspective, further research is needed to investigate the findings of this study in more detail. Emphasis is needed on promoting the presence of these apparent protective factors in older adults and on establishing the role that positive perceptions and attitudes may have as protective factors over time, in stroke and beyond.

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## 12. APPENDICES

## **Appendix 1: Ethical approval**

- **West of Scotland Research Ethics Committee approval letter**
- **NHS Lanarkshire Research and Development approval letter**













## **Appendix 2: Research pack for participants**

- **Invitation to participate**
- **Participant information sheet**
- **Attitudes to Ageing Questionnaire (AAQ)**
- **New Multidimensional Depression Scale (NMDS)**
- **WHOQOL-Old Questionnaire**
- **Demographic Questionnaire**



**Psychological  
Therapies for Older  
People**  
Airbles Road Centre  
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Copyright to Lucy Johnson

Date: 1<sup>st</sup> February 2012  
Your Ref:  
Our Ref:  
Enquiries to : 01698 210021

Dear Sir/Madam

**RE: Research study – ‘Life after stroke - what may affect recovery?’**

You are invited to take part in a research study, which is designed to explore the relationship between attitudes to ageing, quality of life and mood after a stroke.

The member of the Stroke team was asked to provide this research pack to people who would be suitable to take part in the study. Your contact details have not been given out and if you decide not to take part, you will not be contacted by the researcher again.

Information about this study is enclosed in the Participant Information sheet. If you wish, please feel free to discuss it with your friends, family or carers.

To take part, you are asked to complete the enclosed questionnaires, and then return them via post using the pre paid envelope provided or return the completed pack to a member of the stroke team.

If you would like to find out more about the study or would like any guidance completing the questionnaires, please contact me on 01698 210021.

Thank you for taking the time to read this letter.

Yours faithfully

Lucy Johnson  
Trainee Clinical Psychologist  
Psychological Therapies for Older Peoples Service





































### **Appendix 3: Systematic review – Guidelines for submitting to Journal for publication**

- **Psychology & Health**







## **Appendix 4: Journal article – Guidelines for submitting article for publication**

- **Ageing & Society**









**Appendix 5. Table 7. Significant associations between research variables and AAQ scores**

		Total score	Psychosocial loss	Psychological growth	Physical change
Demographic	Activity levels	.441**			.618**
	Age				
	Gender				
	Social support				.429**
	Carer				
	Number strokes				-.420**
	Time since stroke				
	Previous depression		.384**		
	Living situ				
	Occupation				
Stroke impact on life	Independence	.319*	.298*		.342*
	Mobility				.294*
	Financially				.417**
Phys health	CV disease	.303*		.541**	
	High cholesterol			-.413**	
	Hypertension	-.346*	-.311**		
	Occupation				

**Appendix 6. Table 8. Significant associations between research variables and Depression scores (NMDS)**

		Total Depression score	Emotional	Cognitive	Somatic	Interpersonal
Demographic	Activity levels	-.312*			-.369	
	Age					
	Gender					
	Social support					
	Carer					
	Number strokes					
	Time since stroke					
	Prev. depression	-.651**	-.608**	-.672**	-.541**	-.399**
	Living situ					
	Occupation					
Stroke impact on life	Independence	-.455**	-.383**	-.410**	-.535**	
	Mobility					
	Financially					
Phys health	CV disease					
	High cholesterol					
	Hypertension					
	Occupation					

**Appendix 7. Table 9. Significant associations between research variables and WHO QOL scores.**

		Total QOL	Sensory	Autonomy	Activity	Social	Death dying	Intimacy
Demographic	Activity levels	.326*				.549**		
	Age							
	Gender							
	Social support							
	Carer							
	Number strokes			.303*				
	Time since stroke							
	Prev. depression	.341*				.339*		
	Living situ			-.490**				.503**
	Occupation		-.352**					
Stroke impact on life	Independence					.323*	.329*	
	Mobility						.299*	
	Financially						.358*	
Phys health	CV disease							
	High cholesterol	-.412**		-.487**	-.322*			
	Hypertension	-.294*						
	Occupation							

**Appendix 8. Table 10. Significant Inter correlation between demographic research variable**

		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	Age	-																	
2	Gender		-																
3	Act level			-															
4	Soc support			.447**	-														
5	Carer		-.426**			-													
6	N. strokes			.404**			-												
7	Stroke			.407**				-											
8	Prev dep								-										
9	Indep	.296*		.364*	.305**				.305*	-									
10	Finance	.332*		.341*	.446**					.386**	-								
11	Mobility				.425**					.301*		-							
12	Diabetes												-						
13	Hyperten													-					
14	CV disease			.296*								-.292*			-				
15	Arth						-.436**									-			
16	High choles											.301*			-.378**		-		
17	Occup													.366*	-.407**			-	
18	Living								.432**										-

\*correlation is significant at 0.05; \*\*correlation is significant at 0.01